SMITHSONIAN
LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES

REPTILES & AMPHIBIANS
U. S. NATIONAL MUSEUM
APR 9 1973

BULLETIN OF THE

Maryland Herpetological Society

The Natural History Society of Maryland, Inc.

MARCH 1973 VOLUME 9, NUMBER 1

Bulletin of the Maryland Herpetological Society
Volume 9 Number 1 March 1973

Contents

Notes on a unique population of gopher frogs, *Rana areolata*, from Central Florida...David S. Lee 1

Habitat preference of *Sceloporus chrysostictus* and *Sceloporus cozumelae* in the vicinity of Progreso, Yucatan, Mexico..............Jeremy Penner 6

Batrachoseps from Santa Cruz Island, Santa Barbara County, California...Arnold Powers 8

Comments on the identity of a "blue" *Thamnophis* from Maryland.......................................Bill and Donna Marvel 10

Additional notes on Iranian reptiles in the United States National Collection.......................................Robert G. Tuck, Jr. 13

Sections:

Maryland Herpetology.. 15

News and Notes.. 16

Obituary: Dr. James A. Peters.................................... 17

Library of Congress Catalog Card Number: 76-93458

The Cover: An adult specimen of the Marbled Salamander, *Ambystoma opacum.* Photograph by R. S. Simmons.

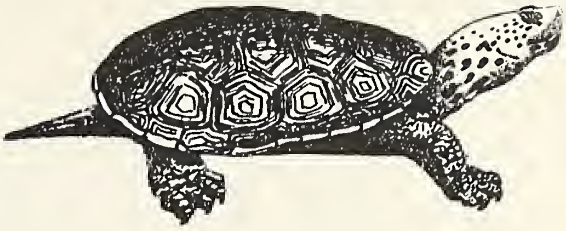
Ed. Note: Manuscripts being submitted for publication should be typewritten (double spaced) on good quality 8-1/2 by 11 inch paper, with adequate margins. Submit original and first carbon, retaining the second carbon. Indicate where illustrations or photographs are to appear in text. Cite all literature used at the end in alphabetical order by author. Reprints are available at $.01 a page ($.02 a page with photographs) and should be ordered when manuscripts are sent in. Minimum order 100 reprints.

MdHS........a founder member of the Eastern Seaboard Herpetological League

The Maryland Herpetological Society, Department of Herpetology, Natural History Society of Maryland, Inc., 2643 North Charles Street, Baltimore, Maryland 21218.

BULLETIN OF THE

mdhs



Volume 9 Number 1 March 1973

The Maryland Herpetological Society
Department of Herpetology, Natural History Society of Maryland, Inc.

Bulletin Staff

Executive Editor	Herbert S. Harris, Jr.
Associate Editors, (this issue)	Brian Leverton, John Funk, Jr.
Photo Editor	Charles L. Smith

Steering Committee

Daniel Carver - Jerry D. Hardy, Jr.
John E. Cooper - Herbert S. Harris, Jr.
John Funk, Jr. - Jeremy Jacobs
Frank Groves - Arnold Norden
John D. Groves - Margaret M. Thomas
Pete Wemple

Officers

Chairman..........Robert G. Tuck, Jr.
Vice Chairman.....Brian Leverton
Secretary.........Mark J. Prihoda
Treasurer.........Bill Marvel
Typist............Donna Marvel

Membership Rates

Active members over 18...$10.00, under 18...$6.00, subscribing members (outside a 20 mile radius of Baltimore City)...$3.00, Foreign...$4.00 per year.

Meetings

The third Saturday of each month, 9:45 a.m. at the Natural History Society of Maryland (Except May-Aug., 8:00 a.m.). The Department of Herpetology meets informally every Wednesday evening at the NHSM at 8:00 p.m.

Notes on a Unique Population of Gopher Frogs, *Rana areolata*, from Central Florida

David S. Lee

Examination of a series of 34 *Rana areolata* from the Lake Wales Ridge (Polk and Highlands Counties) of Florida has revealed the presence of an interesting population of dwarf gopher frogs. Seventeen adult frogs in breeding condition from this population ranged from 58.8-70.9 (65.0) mm total length. [A series of 17 adult specimens from Alachua County measured 75.7-102.5 (90.3) mm total length, 6 from Pinellars County 77.7-87.6 (82.2) mm, and a series of 4 from Marion and Lake Counties 84.8-94.9 (89.9) mm] (See Table 1).

County	Number of Individuals	Sex	T-1	Head Width	Tibia	Tympaniun	Length of 4th Toe
Duval	1	♂	83.1	36.5	41.9	7.5	41.0
	1	?	86.7	37.5	43.9	7.8	42.6
Alachua	6	♀	75.7-96.3 (84.4)	30.9-42.6 (36.7)	34.0-46.0 (40.7)	5.2-7.2 (6.4)	34.3-42.8 (39.0)
	11	♂	84.4-102.5 (93.8)	36.8-42.7 (39.2)	42.2-48.0 (44.5)	6.6-8.9 (7.6)	37.2-43.7 (40.7)
Putnam	1	♀	84.5	37.9	41.0	7.6	38.3
Pinellas	6	♂	77.7-87.6 (82.2)	35.0-39.4 (37.2)	36.1-43.7 (39.9)	6.7-8.3 (7.6)	32.6-39.5 (36.6)
Hernado	1	♂	74.4	31.2	34.6	4.9	32.4
Marion and Lake	2	♀	84.8-93.5 (89.1)	37.2-38.5 (37.8)	39.8-42.5 (41.1)	6.4	37.5-38.3 (37.9)
	2	♂	86.7-94.9 (90.8)	36.5-39.0 (37.7)	38.0-44.3 (41.1)	7.1-7.7 (7.4)	37.6-42.5 (40.0)
Polk and Highlands	2	♀	59.0-70.9 (64.9)	25.1-32.6 (28.8)	30.3-35.2 (32.7)	4.0-7.3 (5.6)	30.8
	15	♂	58.8-70.9 (65.5)	26.5-37.5 (30.7)	29.9-38.0 (33.1)	5.9-7.5 (6.5)	27.8-39.2 (31.7)

Table 1: Measurements (mm) of 48 adult *Rana areolata* from peninsular Florida.

The ground color of the Lake Wales series is lighter and the skin smoother than those from the other populations examined. The ventral surface is virtually unmarked. The dorsal surface spots are fewer, smaller, and rounder than specimens examined from other parts of peninsular Florida (See Figure 1).

The following field notes are from a fresh specimen collected on State Road 544 five miles southeast of Haines City, Polk County, on April 9, 1967 by E. Bostelman and the author. Field Number DSL2228. "An adult male. Total length: 58.8 mm, head width 29.6 mm, tibia 29.9 mm, tympanum (greatest diameter): 5.9 mm, length of 4th toe: 30.6 mm. Ventral surface unmarked except for faint flecking on the chin and throat. Dorsal spots dark, round, small, and arranged in four rows, two of which border the dorsal lateral folds. Spotting on the sides less pronounced. Arms spotted, legs spotted and barred. Yellow conspicuous only on dorsal folds, but traces of yellow on axilla and throat."

I have seen dwarf specimens of *Rana areolata* from the following Florida localities: Polk County; Dundee (1), 5 mi. southeast of Haines City (3), 2 mi. west of Lake Marion (5), 3 mi. east of Lake Hamilton (1), Auburndale (3), Babson Park (1), Highlands County; Avon Park (15), Sebring (2), Archbold Biological Station (3).

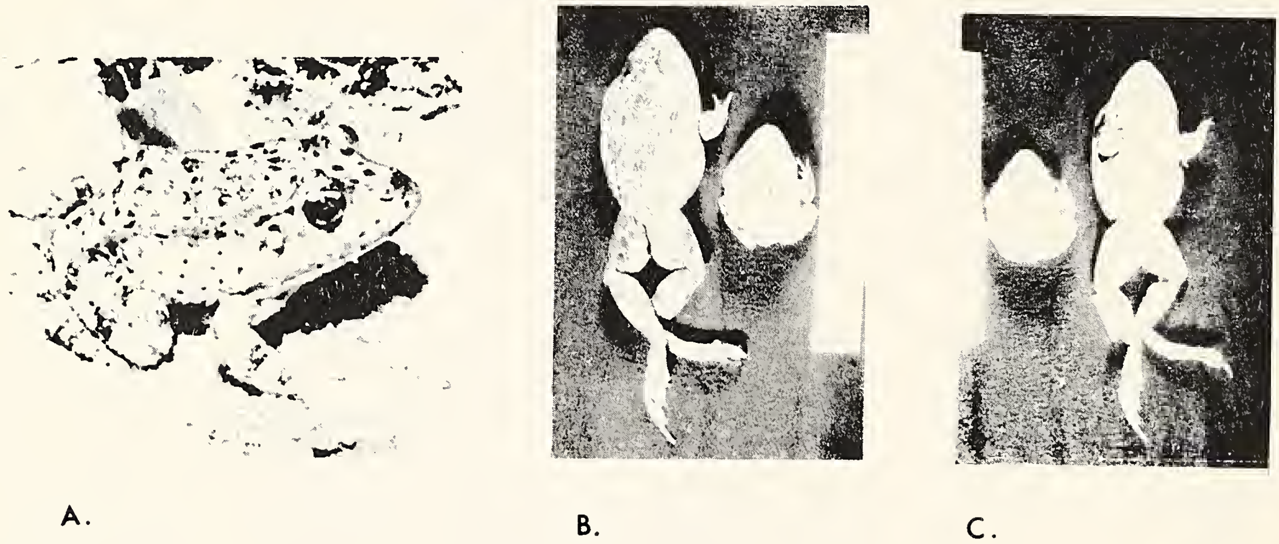


Figure 1. Adult male gopher frogs, *Rana areolata*. (A) collected November 1968 3 mi. east of Lake Hamiliton, Polk County. Size not recorded (Photo R. Simmons). (B) upper specimen nr. Gainesville, Alachua County, lower specimen 2 mi. west of lake Marion, Polk Co., dorsal view. (C) same ventral view.

Occasionally frogs were collected by digging them out of burrows of the gopher tortoise, *Gopherus polyphemus*, but the majority of specimens were found in burrows of the old field mouse, *Peromyscus polionotus*. All individuals were found in sandhill or scrub ecotones, where oaks (*Quercus laevis & Q. geninata)* and widely scattered long leaf pine (*Pinus causa)* form sporadic clumps and the ground remains relatively free of herbaceous growth due to frequent ground fires. Clumps of *Serenoa repens & Aristisa* are scattered throughout these areas. The frogs were found in burrows in open, sandy situations; in places where the vegetation was dense the frogs were not present.

The above described population appears to be limited to the Lake Wales Ridge of Florida (i.e. Auburndale, Polk County to Hicoria, Highlands County) (See Figure 2). This population is ecologically isolated from the rest of Florida by the Peace River to the west, the Kissimmee River to the east, the Green Swamp to the north, and the upper reaches of the Everglades to the south. All of these environs are unsuitable for gopher frogs. Interestingly enough, this species does not occur on the neighboring Lakeland Ridge.

Presumably the differences between the Lake Wales frogs and those from other parts of the state stemmed from separation during the Pleistocene. The population under discussion represents a Pleistocene island form. The highest elevations in peninsular Florida are on this ridge. Similar zoogeographic patterns are known in other species of animals inhabiting the same general area (see Neill, 1957; McCrone, 1963; Mount, 1965, and Zug, 1968). The genetic uniformity of the Lake Wales population seems to have been maintained by the modern ecological barriers mentioned above.

I would like to thank Robert S. Simmons for one of the photographs, R. Sanderson, J. Funderburg, E. Bostelman, and E. Vetter for assistance in collecting the specimens, and Walter Auffenburg (Florida State Museum) and Charles Myers (American Museum of Natural History) for the loan of material.

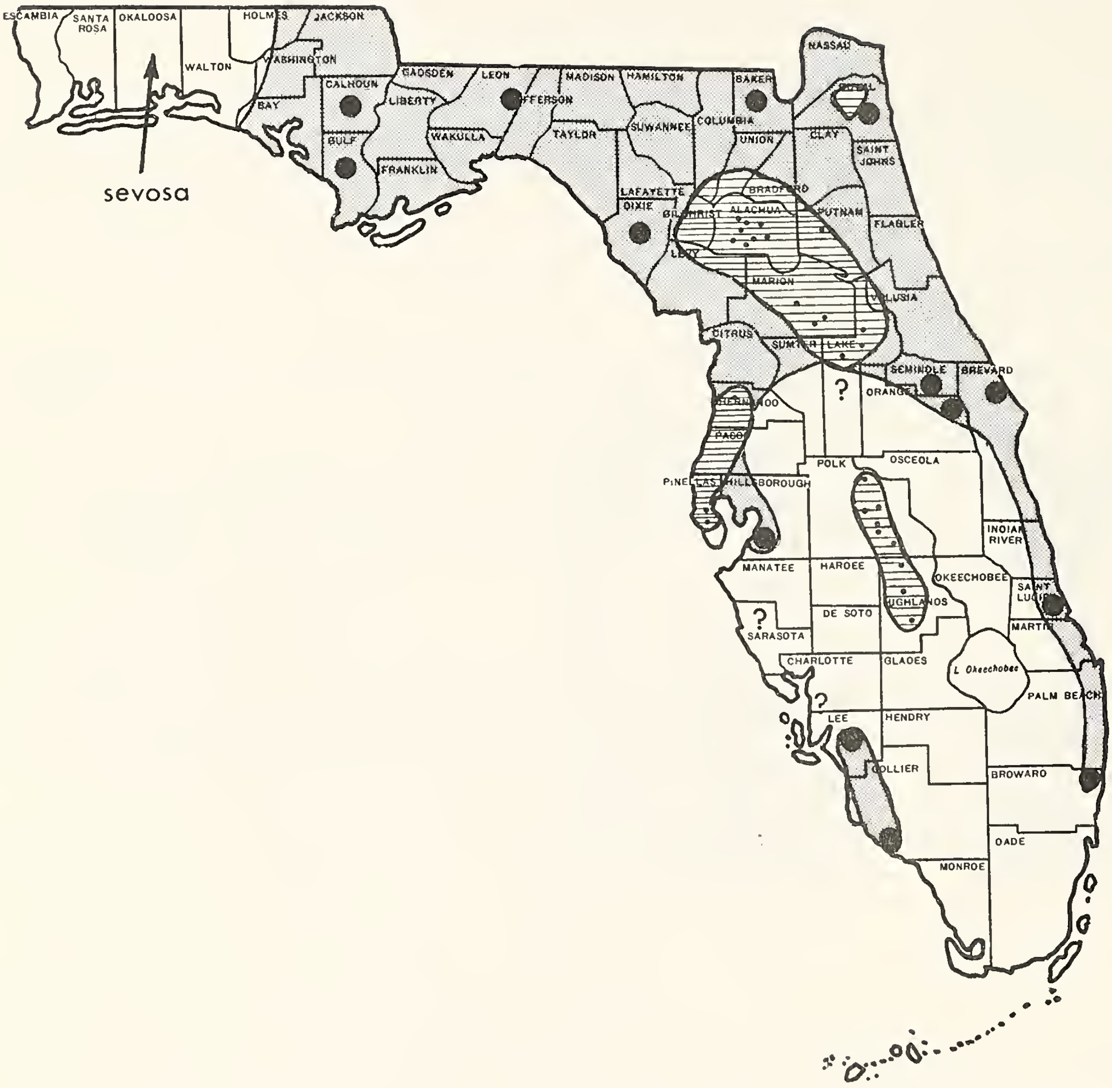


Figure 2: Range of *Rana areolata* in peninsula Florida. ░ presumed range of species. ☰ population from which material was examined. • localities from which individuals were examined. ● additional known localities and/or county records.

Literature Cited

McCrone, John D.
1963. Taxonomic status and evolutionary history of the *Geolycosa pikei* complex in the southeastern United States *(Araneae, Lycosidae)*. Amer. Midland Nat. Vol. 70(1): 47-73.

Mount, Robert H.
1965. Variation and systematics of the scincoid lizard, *Eumeces egregius* (Baird). Bull. Fla. State Mus. Vol. 9(5): 183-213.

Neill, Wilfred T.
1957. Historical bigeography of present-day Florida. Bull. Fla. State Mus. Vol. 2(7): 175-220.

Zug, George R.
1968. Geographic variation in *Rhineura floridana (Reptilia: Amphisbaenidae)*. Bull. Fla. State Mus. Vol. 12(4): 185-211.

Department of Mammalogy, Natural History Society of Maryland, 2643 North Charles Street, Baltimore, Maryland.

Received 23 August 1972

Habitat Preference of *Sceloporus chrysostictus* and *Sceloporus cozumelae* in the Vicinity of Progreso, Yucatan, Mexico[1].

The iguanid lizards *Sceloporus chrysostictus* and *Sceloporus cozumelae* are two relatively abundant representatives of the herpetofauna of Yucatan, Mexico. Although both species are frequently collected, comparatively little is known of the habitat preference of either, other than casual observations made by collectors. Duellman (1965) observed *S. chrysostictus* as abundant in a scrub-forest association, as well as in a prickly pear-grass *(Opuntia-Uniola)* association. He also observed *S. cozumelae* "on white sandy beaches with outcroppings of rock in sparse vegetation as well as on open grassy areas with rocky soil." Maslin (1963) described *S. chrysostictus* as inhabiting outcroppings of rock as well as piled-up masses of limestone. He observed *S. cozumelae* mainly on the shores of Cozumel Island in areas of low shrubs and herbaceous plants. Location of a site by the author where the two species occurred sympatrically presented an opportunity to record comparative ecological data between the two species.

The study occurred in the general area of Progreso,Yucatan, a port city on the Gulf of Mexico, and extended from the shore to approximately 6 km inland. The general physiography of the land was flat. Along the coast was a strip of sandy soil about 1 km wide. South of this area was a salt flat of approximately the same width, and beyond the salt flat, the soil became very rocky with numerous limestone boulders, cobbles, and pebbles. On a number of areas which rose slightly above the level ground were a few cm of soil capable of supporting plant life.

The immediate coastal area near Progreso is heavily settled,and the native vegetation is being cleared rapidly for further housing. In the area of sandy soil, when the vegetation is cleared, the ground is rapidly covered by a tangled mat of puncturevine *(Tribulus grandiflora)*. The natural vegetation is a low thick tangle, with sea grape *(Cocolobis uvifera)*, prickly pear *(Opuntia* sp.), henequen *(Agave fourcroydes)*, fan palms (*Sabal* sp.), and coconut palms (*Cocos nucifera)*, being dominant features in the flora. The salt flat is devoid of vegetation. South of the salt flat is a salt marsh of grasses, interdigitating with a scrub forest dominated by trees of the genera *Acacia*, *Prosopis*, and *Mimosa*, and by prickly pear *(Opuntia* sp.).

S. chrysostictus achieved its greatest abundance in the area of scrub forest and rocky soil, although it was common in the area of sandy soil and low tangled vegetation as well. It was seldom found in association with coconut palms and was absent from the salt marsh. Observations by the author confirm those of Maslin (1963) in describing this species as particularly elusive and difficult to capture for a small sceloporine lizard. Frequently specimens would dart away while the investigator was yet yards distant. When pursued, they ran under rocks, into fissures in limestone outcroppings or among the flat spiny pads of prickly pear.

---

[1] Abstracted from a thesis submitted in partial fullfillment for the Degree of Master of Science at the University of Oklahoma.

S. cozumelae, on the other hand, was most abundant in the low thick tangle of beach vegetation, around puncturevine, and around coconut palms, although also present near the salt marsh. Escape was accomplished by running under the thick mat of puncturevine or darting into the thick tangle of vegetation. Around coconut palms, this species often ran part way up the trunks, dodging around to the side opposite the pursuer, or ran under piles of fronds heaped on the ground.

The author would like to express his appreciation to Dr. Charles C. Carpenter, Professor of Zoology at the University of Oklahoma for serving as major advisor during the course of this study and to Dr. George L. Goodman, Professor of Botany at the University of Oklahoma for his identification of dried plant material collected in Yucatan.

Literature Cited

Duellman, W. E.
1965. Amphibians and reptiles from the Yucatan Peninsula, Mexico. *Univ. Kans. Publ. Mus. Nat. Hist.* 15(12): 579-614.

Maslin, T. P.
1963. Notes on a collection of herpetozoa from Yucatan, Mexico. *Univ. Col. Stud. Ser. Biol.* 9: 1-20.

—Jeremy Penner, *4853 Cordell Avenue, Bethesda, Maryland, 20014.*

Received 13 December 1972

Batrachoseps from Santa Cruz Island, Santa Barbara County, California

Eight islands occur in the California Channel of the Pacific Ocean 10 to 50 miles off the coast of Southern California, from San Clemente to Point Conception. The largest of these islands, Santa Cruz, is approximately 21 miles long and averages 5 miles in width.

Santa Cruz is an island of relatively steep mountain-sides mixed with groves of *Quercus* and *Pinus muricata* and *P. remorata*. The vegetation generally associated with these groves appeared to be *Arctostaphylos*, *Heteromeles*, *Rhus*, *Rhamnus*, *Cercocarpus*, *Ceanothus*, and *Prunus*. However, predominantly the island consists of a coastal scrub vegetation generally associated with *Artemisia*, *Eriogonum*, *Lyonothamnus*, *Coreopsis*, *Opuntia*, and various other composites.

The climate is Mediterranean with a strong maritime influence and is quite similar to the adjacent mainland. The interior valley of the island has a semi-continental climate and often has freezing temperatures during the winter according to Lyndal Laughrin, resident of the University of California's field station.

On 21 November 1972 *Batrachoseps pacificus* (3) and *B. relictus* (26) were collected from a scrub oak, *Quercus*, area near the middle of Stanton Ranch Canyon on Santa Cruz Island. (See Figures 1 and 2). Brame and Murray (1968) proposed that at one time *B. relictus* probably occurred with *B. pacificus* on all the Channel Islands, but it has since become extinct except on Santa Cruz Island. Brame (1970) considers *B. relictus* to be close to the ancestral form that gave rise to all the species in California and northern Baja California.

The previous week had provided at least a full inch of precipitation and the ground, composed of a sandy loam at the sampling site was moist. All specimens were collected at midday, temperature about 70° F., clear and sunny, on an open slope from under various dead oak logs and rocks. The *B. pacificus* were found about 150 feet in elevation higher than the *B. relictus* which were found at about 250 feet above sea level. Both species were found in the same immediate vicinity, adjacent to a wash leading from south of the steep northern side mountain range. It would seem that *B. pacificus* and *B. relictus* occur sympatrically at this location. Brame and Murray (1968) previously suggested sympatric occurrence of these two species on Santa Cruz Island.

These specimens will be placed in the Natural History Society of Maryland collection following live observations.

Figure 1: Santa Cruz Island, California

Figure 2: *Batrachoseps* habitat on Santa Cruz Island, California.

Literature Cited

Brame, A. H. Jr.
1970. A new species of *Batrachoseps* (Slender Salamander) from the desert of Southern California. Los Angeles Co. Mus. Nat. Hist., Contrib. Sci. 200: 1-11.

______________, and Murray, K. F.
1968. Three new slender salamanders *(Batrachoseps)* with a discussion of relationships and speciation within the genus. Los Angeles Co. Mus. Nat. Hist., Bull. 4: 1-35.

—Arnold Powers, *United States International University, 8655 Pomerado Road, San Diego, California 92124.*

Received 27 December 1972

Comments on the Identity of a "Blue" *Thamnophis* from Maryland

Through the courtesy of John D. Groves we recently examined the specimen of *Thamnophis* caught 24 July 1972 in Baltimore County and described in "A Blue *Thamnophis sirtalis sirtalis* from Maryland" (Groves and Boyer, 1972). Attempts to identify this snake using keys in Wright and Wright (1957) and Stebbins (1954) have led us to the conclusion that the specimen is not *Thamnophis sirtalis sirtalis* but a member of the aquatic group *(T. couchi)* of west coast garter snakes. In all characteristics except color pattern, the Baltimore County snake resembles a typical example of *T. couchi hammondi* (See Table 1).

We were unable to detect any blue coloration in the Baltimore County snake, as mentioned by Groves and Boyer, either under natural or artificial light. The dorsum of this snake appears olive gray throughout. Examination under a magnifying glass, however, reveals that individual scales of the dorsum are steel gray with their keels lightly marked with brown. The appearance anteriorly of the very faint dorsal stripe noted by Groves and Boyer is due to wider distribution of this brown pigment on the vertebral scale row and on each adjoining row. There are a series

T. s. sirtalis	*T. c. hammondi*	Baltimore County snake
dorsal rows 19-19-17	dorsal rows 21-21-17	dorsal rows 21-21-17
ventrals 137-167	ventrals 150-178	ventrals 171
upper labials 7	upper labials 8	upper labials 8
eye bordering labials 3 and 4	eye bordering labials 4 and 5	eye bordering labials 4 and 5
preocular single	preocular divided	preocular divided
muzzle not elongated	muzzle elongated, narrow	muzzle elongated, narrow
eyes large but not protruding	eyes large, protruding	eyes large, protruding

Table 1: Comparison of *Thamnophis sirtalis sirtalis*, *Thamnophis couchi hammondi* and the Baltimore County snake.

of small black spots less than one scale wide and spaced one scale apart on the fourth and eighth dorsal rows anteriorly; this arrangement is typical of *hammondi*. Otherwise, the coloration of this snake is as described by Groves and Boyer.

Though this snake has the pale salmon-orange ventral coloration typical of *hammondi*, it lacks the prominent lateral stripes usually found in this subspecies. Fitch (1940) notes, however, that examples of *hammondi* from the area of Monterey, California have only faint lateral stripes.

Finally, the Baltimore County specimen, though feeding regularly on fish and tadpoles, as would be expected of the semi-aquatic *hammondi*, consistently refuses earthworms, a response that would be unusual, to say the least, in a specimen of *T. sirtalis sirtalis*.

If the Baltimore County specimen is an example of *T. couchi hammondi*, as we suspect, its discovery thousands of miles from its expected range and the resulting confusion illustrate the consequences of liberating captive animals in regions to which they are not native.

Literature Cited

Fitch, Henry S.
1940. A biogeographical study of the ordinoides artenkreis of the garter snakes (genus *Thamnophis*). University of California Publications in Zoology, 44(1): 1-150.

Groves, John D. and Donald Boyer
1972. A blue *Thamnophis sirtalis sirtalis* from Maryland. Bull. Md. Herp. Soc., 8(3): 80.

Stebbins, Robert C.
1954. Amphibians and reptiles of western North America. McGraw-Hill, New York, 1-536.

Wright, Albert H. and Anna A.
1957. Handbook of snakes of the United States and Canada, Vol. 2. Comstock Publishing Associates, Ithaca, New York, 565-1105.

—Bill and Donna M. Marvel, *11554 Lockwood Drive, #C-1, Silver Spring, Maryland, 20904.*

Received 17 January 1973

Additional Notes on Iranian Reptiles in the United States National Collection

Tuck (1971) attempted to list all Iranian specimens of amphibians and reptiles in the United States National Collection. Not included in the inventory were four small specimens inadverently stored among a large lot of arthropods and skeletal material, mostly of archeological origin.

The four whole specimens, two lizards and two snakes, were collected 35 km E Gachsaran, Khuzistan Province (Collecting Site 66: Tuck, 1971), by J. W. Neal, Jr., and R. G. Tuck, Jr., February 1964, and may be listed as follows:

Family Gekkonidae

Bunopus sp., USNM 193961-62. S. C. Anderson (pers. comm.) considers these two small lizards to represent an undescribed form, upon which he will publish shortly.

Family Natricidae

Eirenis persica, USNM 193963-64.

Two fresh, nearly complete, albeit disarticulated, skeletons were obtained by anthropologists F. Hole and K. V. Flannery during archeological work in Khuzistan Province, 1963, and may be listed as follows:

Family Emydidae

Mauremys caspica caspica, USNM 195430, Khorramabad, elevation 4000 ft., 33 deg. 31' N, 48 deg. 15' E.

Family Varanidae

Varanus griseus caspius, USNM 195429, Dehloran, elevation 600 ft., 32 deg. 41'N, 47 deg. 16' E, October 1963.

Hole, et al. (1969: 325-326) briefly mentioned reptile bones excavated from several levels of the Dehloran Plain and supplied tentative identifications. These archeological specimens have been returned to the Department of Anthropology, Smithsonian Institution, for storage, and the following tabulations result from a recent re-examination by me:

ALI KOSH ARCHEOLOGICAL SITE, 6000-7000 B.C.

Family Emydidae

Mauremys caspica
43 carapace fragments, 17 plastron fragments, and 3 limb bone fragments.

Family Agamidae

Uromastyx loricatus
46 dentary fragments (27 right, 18 left, 1 side undetermined), and 28 maxillary fragments (17 right, 11 left).

Family Varanidae

Varanus griseus
285 vertebrae, 35 limb bones and fragments, 4 shoulder girdle fragments, 1 pelvic girdle fragment, and 1 left dentary with 2 teeth *in situ*.

TEPE SABZ ARCHEOLOGICAL SITE, 4000-5000 B.C.

Family Emydidae

Mauremys caspica
7 carapace fragments, 3 plastron fragments, and 1 bridge fragment.

Family Varanidae

Varanus griseus
9 vertebrae.

Literature Cited

Hole, F., K. V. Flannery, and J. A. Neely.
1969. Prehistory and human ecology of the Deh Luran Plain: an early village sequence from Khuzistan, Iran. *Mem. Mus. Anthr. Univ. Mich.*, 1, xv+ 144 pp., 43 pls.

Tuck, R. G. Jr.
1971. Amphibians and reptiles from Iran in the United States National Museum Collection. *Bull. Md. Herp. Soc.*, 7(3): 48-86, 9 figs., 23 maps, 1 table.

—Robert G. Tuck, Jr., *5431 - 56th Avenue, No. 3, Riverdale, Md. 20840.*

Received 24 January 1973

MARYLAND HERPETOLOGY

Publish your field notes concerning Maryland amphibians and reptiles. We can utilize all manner of notes, particularly, those dealing with reproduction and life history, feeding, predation, unusual locality records, unusual behavior (and also the usual), etc. Brief accounts containing 75 words or less including the common name, locality (county, specific location), date, observation (eliminate unnecessary words, use phrases where possible), author's name (no address) should be sent to RICHARD FRANZ, DIVISION OF NATURAL SCIENCES, FLORIDA STATE MUSEUM, UNIVERSITY OF FLORIDA, GAINESVILLE, FLORIDA, 32601, or hand them in on Wednesday nights or at the herp meetings.

73-0001. *Frogs*, Worcester Co., Milburn Landing Rec. Area, northern spring peepers and New Jersey chorus frogs calling, 9 Dec. 1972.

David S. Lee

73-0002. *New Jersey chorus frogs*, Kent Co., pond 3 mi.E. Massey, calling, 6 Dec. 1972

David S. Lee

73-0003. *Eastern tiger salamander*, Kent Co., pond 3 mi.E. Massey, first arriving male at pond, 20 Dec. 1972.

Peter Hertil

73-0004. *Eastern tiger salamanders*, Kent Co., pond 3 mi E. Massey, several larvae, 30-36 mm (TL), 29 April 1972.

L. Richard Franz

73-0005. *Frogs*, Howard Co., Columbia City, Willow Bottom Drive, gray treefrogs (fast trill?), american toads, upland chorus frogs, northern spring peepers, calling in chorus at dusk from temporary pond on playfield, heavy rain and cool temperature thoughout the day, 4 May 1972.

L. Richard Franz

73-0006. *Red rat snake*, Montgomery Co., Geo. Washington Mem. Parkway, fresh DOR halfway between Cabin John and D.C. beltway (495), 500 mm (TL), daytime temp. 80°'s, evening rain, road still warm and wet at 8 p.m., October, 1969.

Scott Rae

73-0007. *Northern copperhead*, Carroll Co., Henryton, 8 July 1967, an adult found in hollow log at 1:00 p.m. feeding on adult fence lizard.

John Groves

73-0008. *Timber rattlesnake,* Fredrick Co., Fredrick, adult female collected on 28 May 1972 produced 6 (3 light gray and 3 dark gray) young on 20 August 1972, average SV 293 mm, natal skin shed on 9 September.

John Groves

73-0009. *Black rat snake,* Baltimore Co., Garrison Forrest Rd., 7 October 1972, found clutch of 9 eggs at base of recently felled white oak tree in wood pulp 6 inches from surface, workman killed 7. Two eggs still had not hatched, one contained dead young fully developed (SV 284 mm) average for clutch (SV 278 mm).

John Groves

NEWS & NOTES

A letter received:

> "I enjoyed reading your latest Bulletin (Vol. 8 #4). I would like to add to your notes on climbing habits of *Sternotherus odoratus.* In the summer of 1969, in Whiting, N.J., I found a large male musk turtle basking in a blueberry bush overhanging a stream. The bush was rather large and the base grew from the bank of the stream, and was thick enough to enable the turtle to climb up. It was approx. 4 ft. up from the water. I've also noticed this with captive specimens. They along with snapping turtles have a tremendous climbing ability."

Bob Zappalorti (2 Jan. 1973)

James A. Peters

(1922 - 1972)

Photograph couresty of The Smithsonian Institution

Shelves of specimens awaiting critical examination, notebooks containing accounts of years of field work, piles of correspondence from all points of the Globe, and folders and files of projects and manuscripts in various stages of development -- this could characterize the office and laboratory of any active zoologist. However, when that scientist is someone you've worked for and with during seven important years of your life, the sight of a darkened, silent work area, to which he will never return, strikes terribly deep and sad.

James Arthur Peters was born in Durant, Iowa, on 13 July 1922. At the time of his death from cancer on 18 December 1972, he was in the midst of a brilliant, productive career that wound from Greenup, Illinois, throughout the United States, into Asia during a World War, down through Mexico, and into South America. By 1952 he had earned his doctorate at the University of Michigan, having served stints as research assistant at the Museum of Zoology and teaching assistant in the Department of Zoology. Two years later he had risen to assistant professor in the Brown University Biology Department, and then he spent 1958-59 at the Universidad Central de Ecuador as Fulbright Professor. Returning to the United States, Dr. Peters signed on at San Fernando Valley State College (now California State College, San Fernando Valley) and became a full professor in 1961. From there he moved to the National Museum of Natural History, rising rapidly from associate curator in 1964 to curator-supervisor in 1966.

Starting in 1954, Dr. Peters became the recipient of numerous research grants and awards, varying from the American Philosophical Society, to the National Academy of Sciences and the National Science Foundation, to the Smithsonian Institution.

In the meantime, Dr. Peters' professional responsibilities and offices grew, encompassing a wide range of various positions bestowed upon him. For seven years he was secretary of the American Society of Ichthyologists and Herpetologists, rising to vice-president (1967) and, finally, president (1970). He became secretary of the Society of Systematic Zoology in 1972. He had been active in the Southern Calif. Academy of Sciences, and he was a member of the Council of the Smithsonian Senate of Scientists, a member of the U. S. Department of the Interior Rare and Endangered Species Committee, a member of the I.U.C.N. Survival Service Commission Reptile Group, as well as a councilor on the American Alligator Council, a member of the council of the Biological Society of Washington, and a member of the executive committee and board of directors of the First International Congress of Systematic Biology. In 1970 he served as education committee chairman for the Society for the Study of Evolution.

He was a consultant, advisor, or collaborator on the American Museum "Genera of Reptiles" project, the American Heritage Dictionary, the Encyclopaedia Brittanica (as an author), the University of Kentucky Press, and the MacMillan Publishing Company. His own scientific and research papers numbered more than 100 and included his thesis on the snakes of the subfamily Dipsadinae (1960), the unique *Dictionary of Herpetology* (1964), and the *Catalogue of the Neotropical Squamata* (1970) (with B. R. Orejas-Miranda and R. Donoso-Barros), all of which have become something of classics already by virture of their thoroughness, scope, and demonstration of vision. The paperback collection, *Classic Papers in Genetics*, which he edited in 1959, is now a standard college text.

Although he always demurred, his colleagues honored him several times by christening newly described forms "*petersi*," including two lizards (a teiid and a gekkonid), a coral snake, and an as yet unpublished tortoise.

James Peters was a tall man, his six-foot-four frame physically dwarfing those of us who tagged along beside him. His handwriting, executed rapidly southpaw, always presented a challenge to decipher. His puns were monumental, and they were only part of a whimsical humor that included scribbling the date inside a wadded afterdinner mint wrapper and placing the tiny "time-capsule" atop a never-dusted high ledge in a restaurant near the Museum; he delighted in casual, random spot-checks from time to time, announcing the date of the re-opened wrapper gleefully.

As his interest in computer technics in systematic biology and museum curation was developing, a now-departed Museum official publicly remarked on "Dr. Peters' toys." Dr. Peters' response was to schedule a lecture entitled "Toys in the Attic," a clear reference to the Smithsonian Institution's old image as the Nation's garret. The success of this lecture, and his own enthusiastic interest, led to the production and growth of the newsletter series called MUDPIE, standing for "Museum and University Data, Program, and Information Exchange." He saw clearly the trends in modern science, expecially with regard to the need to put required information into the hands of researchers throughout the world. Indeed, one of his first projects when he arrived at the Smithsonian in 1964 was to begin the Smithsonian Herpetological Information Series (S.H.I.S.), an effort to provide translations from non-Germanic/Romance languages, as well as various oddments compiled here and there and meriting retention and dispersal.

For the future James Peters envisioned museums, universities, and libraries with computer terminals allowing instant entry and retrieval of data, information, and facts. He looked forward to the time when use of the computer was a skill as basic to everyone's training as is reading and writing today. He foresaw a day when access to the accumulated knowledge and wisdom of mankind's entire history would be as simple as dialing a telephone.

And now Dr. Peters cannot directly take part in future advances of computer technology in a museum-university context. His influence, however, will surely continue, even as the symposium he organized for the upcoming International Conference on Systematic and Evolutionary Biology (ICSEB) will be carried through by his colleagues and friends.

Dramatic as have been his influences on herpetology, systematic biology, and zoology in general, it should be pointed out that his commanding and energetic personality has molded the careers and lives of his many students and co-workers. It was not unusual for him to receive letters from former pupils -- many who had him for but one class, one semester, nearly a decade previously. They sought advice, or wanted to let him know they considered him to have been the best instructor they had ever had. It was also not unusal for some of his former students to show up at the Museum when they happened to be passing through Washington. They'd bring their wives or husbands to meet the man they praised as being one of the greatest they'd ever known.

The tragedy of James A. Peter's sudden death is shared by his wife, Beatriz Moisset of Cordoba, Argentina, his six children, his father, and his two brothers.

The great loss is felt by us all.

——Robert G. Tuck, Jr., *5431 - 56th Avenue, No. 3, Riverdale, Md. 20840*

Received 30 January 1973

BOOK RELEASES

GUIDE TO THE TAXONOMIC LITERATURE ON VERTEBRATES

by
Richard E. Blackwelder

Available from:

Iowa State University Press
Press Building
Ames, Iowa 50010

($8.50)

Editor's Note:

The revision and republication of the Distribution Survey of Maryland and the District of Columbia is scheduled for the December 1973 issue of the Bulletin of the Maryland Herpetological Society as initially planned. Since its publication in December 1969, three new amphibians and reptiles have been recorded for the state. Numerous range extensions, new county records, etc. have also been reported. All copies of the survey have been exhausted for some time now, and new requests continue to pour in.

Please check your data, and if you have any new material concerning the distribution of Maryland's amphibians or reptiles send it to:

Herbert S. Harris, Jr.
Curator, Dept. Herpetology
Nat. Hist. Soc. Md., Inc.
2643 N. Charles Street
Baltimore, Maryland 21218

I will acknowledge all data received in the forth coming survey. With your help, we will try and make this revision of the Distributional Survey as complete as possible. Thank you.

HSH

Natural History Society of Maryland
Maryland
Herpetological
Society

REPTILES & AMPHIBIANS
U. S. NATIONAL MUSEUM
JUL 2 1973

ISSN 0025-4231

BULLETIN OF THE

Maryland Herpetological Society

The Natural History Society of Maryland, Inc.

JUNE 1973 VOLUME 9, NUMBER 2

Bulletin of the Maryland Herpetological Society
Volume 9 Number 2 June 1973

Contents

A craniodichotomous queensnake, *Regina septemvittata* (Say) (Serpentes: Natricidae), from Frederick County, Maryland.......Robert G. Tuck, Jr. 22

The first record of *Caretta caretta caretta* nesting on a Maryland Beach..Stephan Graham 24

A northern pine snake, *Pituophis m. melanoleucus*, from Maryland...................................William L. Grogan, Jr. 27

A review of the purpose of the rattle in Crotalids as a defensive diversionary mechanism..........................Arnold Powers 30

An additional Corn Snake, *Elaphe guttata guttata*, from Western Maryland...............W. L. Grogan, Jr. and J. J. White, Jr. 33

Sections:

News and Notes.. 34

Library of Congress Catalog Card Number: 76-93458

The Cover: An adult Northern Pine Snake, *Pituophis m. melanoleucus* from Maryland (See page 27.) Photograph by William V. Horvath.

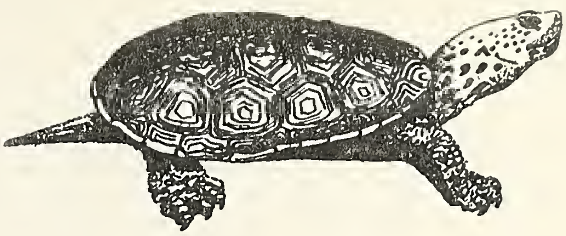
Ed. Note: Manuscripts being submitted for publication should be typewritten (double spaced) on good quality 8-1/2 by 11 inch paper, with adequate margins. Submit original and first carbon, retaining the second carbon. Indicate where illustrations or photographs are to appear in text. Cite all literature used at the end in alphabetical order by author. Reprints are available at $.01 a page ($.02 a page with photographs) and should be ordered when manuscripts are sent in. Minimum order 100 reprints.

MdHS........a founder member of the Eastern Seaboard Herpetological League

The Maryland Herpetological Society, Department of Herpetology, Natural History Society of Maryland, Inc., 2643 North Charles Street, Baltimore, Maryland 21218.

BULLETIN OF THE

mdhs



Volume 9 Number 2 June 1973

The Maryland Herpetological Society
Department of Herpetology, Natural History Society of Maryland, Inc.

Bulletin Staff

Executive Editor	Herbert S. Harris, Jr.
Associate Editors (this issue)	Brian Leverton, John Funk, Jr.

Steering Committee

John E. Cooper - Jeremy Jacobs
Frank Groves - Arnold Norden
John D. Groves - Mark J. Prihoda
Jerry D. Hardy, Jr. - Margaret M. Thomas
Herbert S. Harris, Jr. - Peter Wemple

Officers

President	Brian Leverton
Vice-President	John Funk, Jr.
Secretary	Daniel Carver
Treasurer	William M. Marvel
Typist	Donna Marvel

Membership Rates

Active members over 18...$10.00, under 18...$6.00, subscribing members (outside a 20 mile radius of Baltimore City)...$3.00, Foreign...$4.00 per year.

Meetings

The third Saturday of each month, 9:45 a.m. at the Natural History Society of Maryland (Except May-Aug., 8:00 a.m.). The Department of Herpetology meets informally every Wednesday evening at the NHSM at 8:00 p.m.

A Craniodichotomous Queensnake, *Regina septemvittata* (Say) (Serpentes: Natricidae), from Frederick County, Maryland

Tuck and Hardy (1970) attempted to list all documented cases of axial bifurcation in snakes since Cunningham (1937). Included in the listing for craniodichotomous (i.e., "two-headed") specimens was an example of queensnake, *Regina septemvittata,* originally mentioned in a newspaper article (Goldberg, 1967) and preserved in the National Museum of Natural History (USNM), Smithsonian Institution.

This specimen, USNM 164350, and a normal sibling, USNM 164351, were taken unborn from a pregnant female killed at a small creek along U.S. Route 40 in the vicinity of New Market, approximately 3 1/2 miles ESE of Frederick, Frederick County Maryland, by Dale R. Bowyer on 9 September 1967. Subsequently, the teratological individual was exhibited at the Frederick County Fair and then donated along with the normal specimen to the Smithsonian Institution by Mr. Bowyer (Accession Number 275666). Measurements and scale counts taken from these two individuals are compared below.

	USNM 164350	USNM 164351
Snout-vent Length	124.0 mm	141.5 mm
Tail Length	50.5 mm	54.0 mm
Dorsal Scale Rows	19	19
Supralabials (r/l)	7/7	7/7
Infralabials (r/l)	8/8	9/10
Ventrals	142	148
Anal Plate	divided	divided
Subcaudals (pairs)	81	80
Temporal Scales (r/l)	1+2/1+2	1+2/1+2
Umbilical Scar	v. 119-120	v. 129-130

In USNM 164350 the heads are joined behind the level of the eyes. Labials anterior to the juncture are broken into small, irregular scales after the second on the left side of the right head and after the fourth on the right side of the left head. The occipital region is marked by a relatively large white spot. No abnormalities posterior to the head were noted.

Literature Cited

Cunningham, B.
1937. Axial bifurcation in serpents. An historical survey of serpent monsters having part of the axial skeleton duplicated. Duke University Press, Durham, North Carolina. *vii + 117*, 12 plates.

Goldberg, S.
1967. Prize snake for Dale: it has two heads. *The News*, Frederick, Maryland, 14 September 1967, photo.

Tuck, R. G. Jr., and J. D. Hardy, Jr.
1970. An amphidichotomous northern black racer, *Coluber c. constrictor*, from Maryland and a resume of recent records of axial bifurcation in snakes. *Bull. Md. Herp. Soc.*, 6(3): 37-48.

—Robert G. Tuck, Jr., *Curator in Zoology, Department of Environmental Conservation P.O. Box 1430, Teheran, Iran.*

Received 31 January 1973

The First Record of *Caretta caretta caretta* Nesting on a Maryland Beach

Due to the negative pressures exerted on sea turtle populations by man, new information on breeding activities may aid conservationists in protecting the species. Caldwell and Rathjen (1969) state that protection of nesting females, nesting sites and emerging young offer the most significant conservation measures. They further state that nesting records should, therefore, be kept up to date. At present, no records exist for the nesting of the Atlantic loggerhead turtle, *Caretta caretta caretta* on Maryland beaches. The following note will document one such nesting.

On 22 July 1972 a female *Caretta caretta caretta* weighing approximately 300 pounds was observed laying 133 eggs at 0300 hr on a beach at Ocean City, Worchester County, Maryland. At this time the ocean temperature was 21° C and the air temperature 22.5° C, with northwesterly winds at 15 knots. The moon was full.

The site of the nest was well camouflaged and was 2 meters from the high tide mark. The nest was 79 cm deep and 20 cm in diameter. The top egg was 36 cm below the surface. The nest was within 6 meters of an actively used building.

Because the heavily populated beach would not have been suitable for hatching, the eggs were carefully removed and packed in some of the moist sand surrounding the nest, and taken back to Salisbury. They were then placed in clay pots with glass lids. For the next 60 days they were mist sprayed daily and kept at a constant temperature of 27° C.

On 12 August 1972, three weeks after they were laid, four eggs were removed and checked. Three appeared to be infertile but the fourth contained a living embryo.

The first hatchling appeared during the night of 20 September 1972. Following is the record of hatching success:

Successful Hatchings		Deaths
20 September	1	
21 September	1	
22 September	3	
23 September	2	23 September (abnormally large yolk sac still attached, apparently premature) 1 turtle.
24 September	3	
25 September	2	
26 September	2	
28 September	2	28 September (no apparent cause) 1 turtle.
29 September	2	29 September (no apparent cause) 1 turtle.
30 September	2	

The carapace lengths of the hatchlings ranged from 17.46 to 19.02 mm (mean 18.10 mm) and the widths ranged from 6.35 to 7.14 mm (mean 7.01 mm). Their weights varied from 17 to 19 g.

After hatching, the turtles were placed in 27° C sea water. No attempt was made to feed them as the available data indicated they would not eat during their first week.

On 4 October 1972 the remaining eggs were checked, all 113 were dead. It appeared that all had stopped developing at the same time (possibly due to rough handling during removal from nest). The dead eggs were yellowish in color and depressed into almost a cup shape. The viable eggs retained their near white coloration but were not fully rounded. Even at the time of hatching, they had noticeable depressions.

On 28 September 1972, twelve of the hatchlings were taken to the National Zoo in Washington D.C., where they will be raised to approximately 200 g size and then sent to Dr. Michael Dicks, University of Georgia, to be released at Little Cumberland Island, Georgia. At this size they can be banded in order to trace migratory routes.

On 30 September, three hatchlings were released at the Assateague Island National Seashore, where for the last four years, nests of loggerhead turtles have been relocated in an attempt to establish a rookery. As of this date 1,082 hatchlings have been released from the area. A female loggerhead laid eggs on this beach during 1972, but they failed to hatch.

The remaining two young were shipped on 2 October 1972, to Audubon Park Zoo, New Orleans, Louisiana.

I would like to thank John D. Groves and Arnold W. Norden for their assistance in the preparation of this note.

Literature Cited

Caldwell, David K. and Warren F. Rathjen
1969. Unrecorded West Indian nesting sites for the Leatherback and Hawkbill sea turtles, *Dermochelys coriacea* and *Eretmochelys i. imbricata.* *Copeia* 1969; 4: 622-623.

—Stephan Graham, *Director, Salisbury Zoo, Salisbury, Maryland.*

Received 9 February 1973

A Northern Pine Snake, *Pituophis m. melanoleucus,* from Maryland

Whether or not the northern pine snake, *Pituophis m. melanoleucus,* is indigenous to Maryland has been under debate for some time. It is not the intention of this author to verify its presence in Maryland, but to review the problem and to report a specimen recently taken within the state.

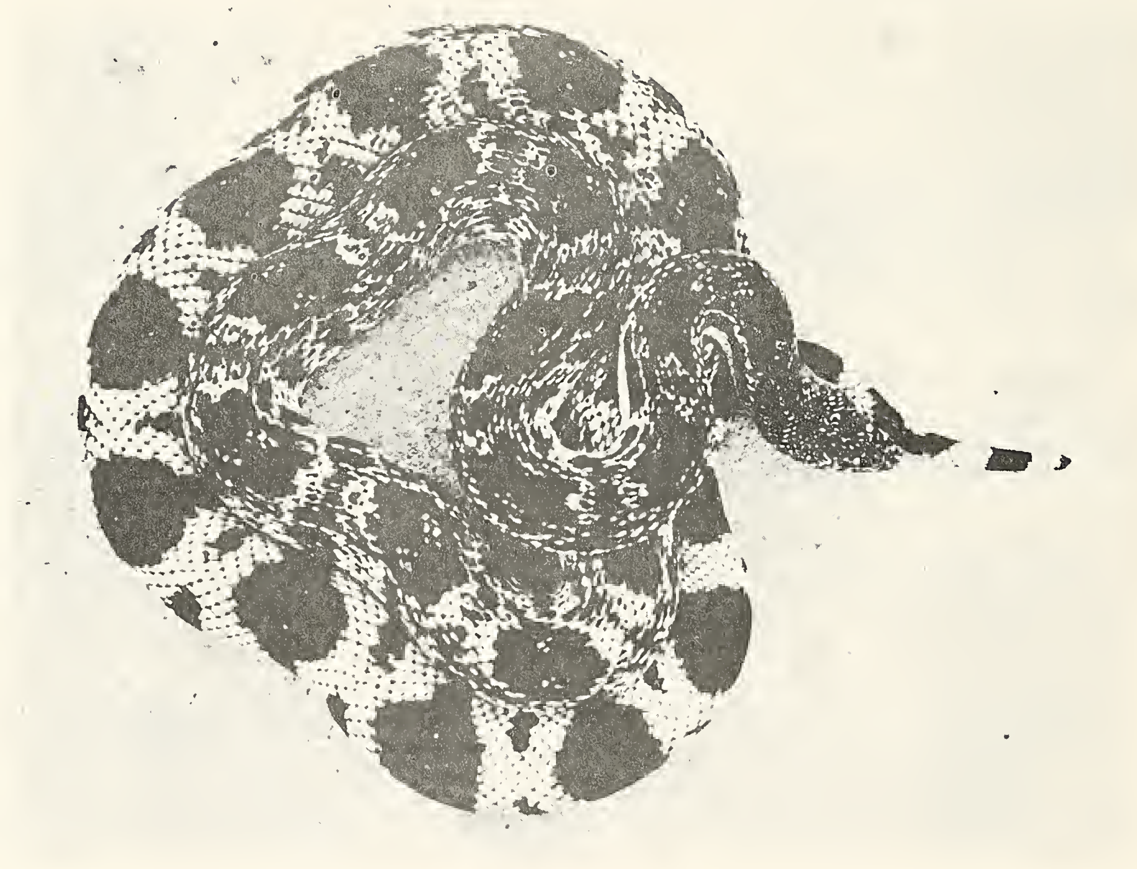


Figure 1: An adult Northern Pine Snake, *Pituophis m. melanoleucus* (USNM 194783) from Fort Meade, Anne Arundel County, Maryland, collected 3 August 1970.

The first reference to a pine snake specifically from Maryland was by Kelly, Davis, and Robertson (1936). They reported a specimen from near Centreville, Queen Anne's County taken August 1930 with no other data. McCauley (1945) stated that he examined this specimen, but did not accept it as valid as it was not collected by the authors. Cooper (1960) also discounted this specimen. Kelly, Davis, and Robertson (1936) listed an additional specimen of *Pituophis* from Worcester County described by Dr. R. V. Truitt. McCauley (1945), from correspondence with Dr. Truitt, recorded this specimen as having been collected 3/4 mi. from Snow Hill, nr. the Pocomoke River with no date. In speaking with Dr. Truitt during July 1971, he gave me an approximate date of 1924, and still seemed to remember the incident well nearly 50 years later. McCauley (1945) also records a specimen from Isle of Wight, Worcester County, ca. September 1936. The specimen was identified by Walter Connell, now Professor of Entomology at the University of Delaware, but it was not preserved and not examined by McCauley. Cooper (1960) apparently accepted this record and the one reported by Truitt, but states that the records may not be valid as there are no specimens to substantiate them. Harris (1967, 1969) does not include the pine snake as part of the Maryland fauna and states that its existence within the state is doubtful as no specimens are available. Lee (1972) mentions a pine snake observed by Irving Hampe in the spring of 1969 swimming in Sinepuxent Bay, Worcester County, but gave no specific locality. He also reported that a ranger at Assateague Island State Park observed that pine snakes swam out to the island in May to eat eggs of nesting birds. Mr. Wes Fortney, a ranger at Shad Landing State Park in Worcester County recently informed me that he has seen pine snakes in the vicinity of the park.

On 3 August 1970 Sgt.Howard DeWeese a forest ranger for the U. S. Army collected a pine snake from Fort Meade, Anne Arundel County, Maryland. The specimen was taken 1 mi. E of Tipton Army Airfield in an extensive wooded area. I visited the locality with Sgt. DeWeese where he related its capture. He remarked that it was taken in the open during the day and that it vibrated its tail and hissed, but made no attempt to bite, which is typical behavior for this species. This locality consists mainly of virginia pine *Pinus virginiana* and pitch pine *Pinus rigida* with scattered hardwoods, the forest floor is covered with pine needles to a depth of 2 - 3". The soil beneath is very loose sand providing the type of habitat that this species needs for its fossorial habits.

This specimen was given to John White by Sgt. DeWeese and was kept in his care for over 2 years. During this period of captivity it fed infrequently, consuming 25 mice, 7 birds, 1 mole, and 1 vole; it gradually lost weight. It shed 5 times during this period.

The specimen, an adult female, with a total length of 1455 mm and a snout-vent length of 1270 mm appears normal for the species except for an unusual amount of black pigment (Figure 1) on the head and anterior part of the body. At the time of capture the left eye had accumulated several eye caps, causing loss of vision in that eye and this condition persisted until time of preservation. It is catalogued (USNM 194783) in the collection of the National Museum of Natural History, Smithsonian Institution.

All specimens of the pine snake previously reported from the state have been reported from the Maryland portion of the Del-Mar-Va peninsula. Previous authors have stated that this area would offer the most suitable habitat for *Pituophis* because of its rather extensive loblolly pine *(Pinus taeda)* forests. However, loblolly pine does not occur in New Jersey or the western portions of Virginia, both areas in which there are populations of pine snakes. Furthermore, pine snakes have not been recorded within the range of loblolly pine in Virginia. Virginia and pitch pine are the dominant forms within the northern limits of the range of *Pituophis* in New Jersey and western Virginia. These two species of pine are present in similar habitat on the western shore of Maryland. This indicates the possibility that there may be yet relict populations of pine snakes on the western shore in addition to what was thought its supposed range on the Del-Mar-Va peninsula. If pine snakes do exist in Maryland they were undoubtedly more common and widespread during the Pliestocene when conifers were more extensive in the state and were not in such direct competition with hardwoods.

Further searching for this species within Maryland, Delaware and Virginia may as yet yield new material. However, my own experience in collecting this form has been unrewarding and it may be many years before its status in Maryland can be ascertained.

I would like to thank John White for allowing me to report upon this specimen and deposit it in a scientific collection. Thanks are also due William V. Horvath whose photograph appears within.

Literature Cited

Cooper, J. E.
1960. Distributional Survey V of the Maryland and the District of Columbia. *Bull. Phila. Herp. Soc.* May-June: 18-24.

Harris, H. S., Jr.
1967. *Pituophis*: Notes on validity. *Maryland Herpetofauna Leaflet.*, Number 11 (contains a description of *Pituophis* by John D. Groves), June 17.

________________.
1969. Distributional survey: Maryland and the District of Columbia. *Bull. Md. Herp. Soc.* 5(4): 97-161.

Kelly, H. A., A. W. Davis and H. C. Robertson
1936. Snakes of Maryland. Nat. Hist. Soc. Md., 103 pp.

Lee, D. S.
1972. List of the amphibians and reptiles of Assateague Island. *Bull. Md. Herp. Soc.* 8(4): 90-95.

McCauley, R. H., Jr.
1945. The Reptiles of Maryland and the District of Columbia. Pub. by Author, 194 pp.

—William L. Grogan, Jr., *Department of Entomology, University of Maryland, College Park, Maryland, 20742.*

Received 2 March 1973

A Review of the Purpose of the Rattle in Crotalids as a Defensive Diversionary Mechanism

Piso (1648) first suggested the rattle of the rattlesnake as used as a warning mechanism. Klauber (1940, 1956) discussed the structure of the rattle in great detail, concluding that it was a warning device, often, but not always, effective in discouraging the attacks of intruders. Whether the rattle signal was meant to warn away intruders to avoid injury to the rattlesnake by the intruder, or vice-versa, or possibly as Taylor (1892) proposed to conserve venom and fangs, remains open to debate.

Garman (1889) also thought tail vibration by snakes to be a widely existing nervous reaction upon the part of a threatened or angered snake, which is by no means restricted to rattlesnakes, might be designed to protect the tail from enemies, or to draw the attention of prey away from the threatening head. It was suggested by Shaler (1872) that the resemblance of the sound of the rattle to that of a cicada might lure birds or other insectivorous animals within reach of the snake. Shaler also considered that the vibrating of the snake's tail provides "an escape of nervous force restrained from other modes of expression at the moment."

The caudal lure was first described by Ditmars (1907) in noting that juvenile *Agkistrodon contortrix* had bright yellow tails. When live prey was introduced into the cage, the juvenile copperheads would wriggle their tails in a manner suggestive of insect larvae or grubs. Ditmars thought it probable that frogs would be deceived by the lure. Neill (1960) has provided a series of photographs depicting juvenile *Agkistrodon b. bilineatus* luring an *Anolis c. carolinensis* and a *Bufo quercicus* by tail-waving.

Kauffeld (1943) raised broods of *Crotalus lepidus klauberi* and *C. p. pricei*. The juvenile green rock rattlesnakes had yellow tails and the twin-spotted rattlesnakes did not. The *C. l. klauberi* often lay coiled, camouflaged, and motionless except for the tail: this appendage was wriggled in a manner again suggestive of insect larvae. The *C. p. pricei* with the black tails exhibited no such behavior.

It has been my recent experience with the large and relatively docile *C. r. ruber* and the more ill-tempered *C. viridis helleri* that they will not rattle when confronted in captivity with live prey that does not pose an immediate threat of injury. However, when confronted with an aggressive *Spermophilus beecheyi nudipes* both rattlesnakes will withdraw to a defensive coil and rattle loudly. In the coil the head is generally held low and away to one side with the rattle held high to the opposite side. I have experimented numerous times pitting ground squirrels against red diamond and southern Pacific rattlesnakes with much the same result. When placed in the snake's approximate 30cm X 32cm X 54cm terrarium the ground squirrel would immediately seek escape and the rattlesnake would rattle loudly. At this point the ground squirrel would usually attempt to cover the rattlesnake with sand or attack the "buzzing" rattle, which inevitably would allow the rattlesnake a clear strike. This seems to reflect what Garman (1889) considered one of the purposes of the rattle, as a diversionary method of drawing the attention of the adversary away from the threatening head and enabling the rattlesnake a clear strike. Only when the adult rattlesnake is confronted with prey which poses a threat does it utilize the diversionary mechanism technique. Whereas, the juvenile rattlesnake because of its smaller size and limited experience is threatened by most anything.

It can be surmised that the rattle is widely successful as a diversionary defensive mechanism among other uses. This can be attested by Bogert (1960), in that one group of rattlesnakes *(Crotalus)* is more widely distributed in the Americas than any other genus of reptiles.

Literature Cited

Bogert, C. M.
1960. The influence of sound on the behavior of amphibians and reptiles. *American Institute of Biological Sciences, Wash. D.C.*, (7): 137-320.

Ditmars, R. L.
1907. The Reptile Book. Garden City, N. Y., pp. xxxii + 472.

Garman, S.
1889. On the evolution of the rattlesnake. *Proc. Boston Soc. Nat. Hist.*, 24: 170-182.

Kauffeld, C. F.
1943. Growth and feeding of new-born Price's and green rock rattlesnakes. *Am. Midl. Nat.*, 29(3): 607-614.

Klauber, L. M.
1940. A statistical study of the rattlesnakes. VII* The rattle, Part 1. *Occ. Papers San Diego Soc. Nat. Hist.*, (6): 1-62.

1956. Rattlesnakes: their habits, life histories, and influence on mankind. 2 Vols. Univ. Calif. Press.

Neill, W. T.
1960. The caudal lure of various juvenile snakes. *Quarterly Jour. of the Florida Acad. of Sci.*, 23(3): 173-200.

Piso, G.
1648. De medicina brasiliensi. Lugduni Batavorum et Amstelodami, pp. viii + 122 + ii.

Shaler, N. S.
1872. The rattlesnake and natural selection. *American Nat.*, 6(1): 32-37.

Taylor, W. E.
1892. Catalogue of the snakes of Nebraska with notes on their habits and distribution. *American Nat.*, 26(309): 742-752.

—Arnold Powers, *United States International University, San Diego Campus, San Diego, California 92131.*

Received 21 March 1973

An Additional Corn Snake, *Elaphe guttata guttata*, from Western Maryland

The corn snake, *Elaphe guttata guttata*, was first reported from the Valley and Ridge Section of Maryland's Appalachian Province, in Washington County by Norden (1971). Grogan (1971), reported the first record of this species from West Virginia, a specimen from Morgan County approximately 5 miles SW of the specimen reported by Norden. Harris (1971), mentions 2 other specimens from Washington County, Maryland, and an additional specimen from Morgan County, West Virginia that was reported to him at the time by the senior author. Grogan (1973), reports this second specimen from West Virginia and announces its deposition in the collection at the National Museum of Natural History (USNM 194782).

On 18 September 1971, a corn snake was taken by Mike Ferenc, 1/2 mi.W of Hill Creek along the C & O Canal in the Lillie-Aaron Straus Boy Scout Camp, Allegany County, Maryland. This specimen, an adult male, with a total length of 53 inches, represents a county record for Allegany County. It was kept in the care of the collector for over 2 years until received recently by the junior author. The specimen is catalogued R1797NHSM in the collection of the Natural History Society of Maryland.

This specimen, as well as the other adults of this species from western Maryland and West Virginia exhibit the dark phase color pattern similar to that seen by the senior author in specimens from western Virginia. Further collecting may determine whether populations in West Virginia and western regions of Maryland and Virginia are similar to and contiguous with populations on the Coastal Plain of Maryland (Harris, 1969), Delaware, and Virginia.

Literature Cited

Grogan, W. L., Jr.
1971. The first record of the Corn Snake, *Elaphe guttata guttata*, from West Virginia. *Bull. Md. Herp. Soc.*, 7(4): 95-96.

________________.
1973. Geographic Distribution: *Elaphe guttata guttata*. *HISS News-J.* 1(1): 21.

Harris, H. S., Jr.
1969. Distributional Survey: Maryland and the District of Columbia. *Bull. Md. Herp. Soc.*, 5(4): 97-161.

________________.
1971. Editor's Note. *Bull. Md. Herp. Soc.*, 7(4): 96.

Norden, Arnold
1971. A Corn Snake, *Elaphe guttata guttata*, from western Maryland. *Bull. Md. Herp. Soc.*, 7(1): 25-27.

—Willian L. Grogan, Jr. and John J. White, Jr., *Department of Entomology, University of Maryland, College Park, Maryland 20742 and 1101 Colony Ridge Road, Odenton, Maryland 21113.*

Received 1 April 1973

NEWS & NOTES

The following officers were elected at the "Steering Committee and Business Meeting" held 7 March 1973:

President - Brian Leverton (ex. Vice-Pres.)
Vice-President - John Funk, Jr.
Secretary - Daniel Carver
Treasurer - William M. Marvel (re-elected)

Steering Committee-

John E. Cooper
Frank Groves
John D. Groves
Jerry D. Hardy, Jr.
Herbert S. Harris, Jr.
Jeremy Jacobs
Arnold Norden
Mark J. Prihoda
Margaret M. Thomas
Peter Wemple

The slate listed in the March issue (Vol. 9, No. 1) was elected at the December 1972 meeting. Unforeseen events prompted two resignations, requiring a new election. This was accomplished as stated above at the March meeting of the Steering Committee.

Mr. Robert G. Tuck, Jr. resigned as President of the Maryland Herpetological Society to accept a post as Curator in Zoology for the Iranian Department of Environmental Conservation in Teheran, Iran. He was also ESHL Coördinator/Founder, *Herps-Accord* Editor and a trustee of the Natural History Society of Maryland, Inc. His new responsibility is to assist in the development of a new natural history museum in the Persian capital of Teheran.

Mr. Mark Prihoda was called to duty aboard the U.S.S. Hope now located at Maceió, Brazil, and had to resign as Secretary.

On the cover, in the upper right hand corner, you will notice the following: ISSN 0025-4231. This is the International Standard Serial Number for the *Bulletin of the Maryland Herpetological Society*. It is an internationally accepted code for the identification of serial publications and will aid subscription agencies and libraries in ordering the *Bulletin of the Maryland Herpetological Society*.

IMPORTANT NOTICE:

Following is a new and revised set of "General and Specific Statements". These statements were prepared by the *ad hoc* committee appointed by Mr. Tuck (December 1972), then President of the Maryland Herpetological Society. Mr. Daniel J. Lyons chaired the committee and was supported by Mr. Frank Groves, and Mr. John Groves. These "statements" are as prepared by the committee. There are already numerous changes suggested and we assume that there will be more. Please read the statements very carefully and send your suggestions (pro or con) to the Maryland Herpetological Society (2643 N. Charles St., Baltimore, Maryland 21218).

At the next steering committee meeting (5 September 1973) all changes, etc. will be considered and a final draft will be voted on. It is extremely important therefore that you attend this meeting. The "General and Specific Statements" when completed, will govern the operation of the Maryland Herpetological Society for the foreseeble future. Please plan to attend.

THE GENERAL AND SPECIFIC STATEMENTS WHICH GOVERN THE OPERATION OF THE MARYLAND HERPETOLOGICAL SOCIETY

Because of the growing interest in herpetology and because of the desirability to meet with and belong to a group that shares this interest, the members of the Department of Herpetology of the Natural History Society of Maryland, acknowledging and accepting the authority of this parent organization and having received official sanction from the officers and Board of Trustees of the Natural History Society of Maryland, do hereby declare that this new group shall be an official and active arm of the Department of Herpetology of the Natural History Society of Maryland and shall be called the Maryland Herpetological Society.

General Statements

I. The purposes of the Maryland Herpetological Society:
   A. To be actively concerned with the study and preservation of the herpetological fauna of the State of Maryland, adjacent and foreign areas
   B. To desseminate information of a herpetological nature.

II. The officers of the Maryland Herpetological Society:
   A. Shall consist of a President, Vice-President, Secretary and Treasurer with duties and responsibilities as specified in the Specific Statements
   B. Shall be elected for a period of one year.
   C. Shall select suitable persons to serve at their pleasure who will provide them with suggestive counsel.

III. The membership of the Maryland Herpetological Society:
   A. Shall consist of any person who expresses an interest in herpetology and meets the requirements for membership as listed in the Specific Statements.
   B. Shall be entitled to all of the rights and privileges of membership as listed in the Specific Statements.
   C. Shall conduct themselves properly and in accordance with the laws of society and local custom or face disciplinary action as listed in the Specific Statements.

IV. The relationship between the Natural History Society of Maryland and and the Maryland Herpetological Society:
   A. Shall be one of mutual cooperation, growth and respect.
   B. Shall see the Natural History Society of Maryland providing aid and counsel when necessary.

C. Shall see the Maryland Herpetological Society giving mention to the Natural History Society of Maryland whenever possible.

V. The amendment of or addition to the General and Specific Statements:
   A. May be submitted to the President of the Maryland Herpetological Society by any members of the Maryland Herpetological Society or officer or member of the Natural History Society of Maryland or its affiliates.
   B. Must be acted upon by the officers of the Maryland Herpetological Society within thirty days of initial receipt.
   C. Must be made known to the general membership of the Maryland Herpetological Society and receive the approval of the officers and Board of Trustees of the Natural History Society of Maryland.

Specific Statements

The Specific Statements relate directly to the General Statements of the same heading and are stated so as to clarify, regulate, direct, limit and define their meaning.

I. PURPOSE
   A. The Maryland Herpetological Society shall use the existing facilities at the Natural History Society of Maryland for the scientific study of reptiles and amphibians. Members shall be encouraged to use this place for their personal studies and for studies that are deemed necessary by the officers. These studies shall concern themselves with the herpetological fauna of Maryland and any other area of interest. The Maryland Herpetological Society will also assist the State of Maryland, Baltimore City and prominent groups in matters related to herpetology when requested so to do.
   B. The Maryland Herpetological Society shall publish the results of the members' herpetological investigations and re-publish papers of herpetological note that are no longer generally available. This information is to be made available to the membership. The Maryland Herpetological Society will hold regularly scheduled meetings, the subject of which will be concerned with herpetology and related subjects.

II. OFFICERS

A. The duties of the officers of the Maryland Herpetological Society are as follows:

President - shall preside at all meetings, arrange for speakers at the meetings, develop a program of instruction for the membership, plan and lead field trips, and see to it that there is a general impetus of growth for the Maryland Herpetological Society. The President will also appoint committees to serve at his pleasure.

Vice-President - shall assist the President and other officers when requested and preside at meetings in absence of the President.

Secretary - shall be responsible for all official correspondence and shall investigate and pursue methods and ways of increasing the membership.

Treasurer - shall be responsible for all finances handled by the Maryland Herpetological Society, maintaining an account(s) at a bank(s) approved by the other officers, an up-to-date membership list, and report on the financial state of the Maryland Herpetological Society on a yearly basis.

The officers shall meet during December of each year and by a majority vote elect a person who will serve as editor of the Maryland Herpetological Society Bulletin and direct that person to see to the publication of this bulletin on a quarterly basis. The officers shall also meet once a year with the editor and discuss and decide upon any changes in format and content of the bulletin.

B. The officers of the Maryland Herpetological Society shall be elected to office for a period of one year by members present at a meeting during December of each year. The officers will assume office on January 1st of the following year.

C. The President of the Maryland Herpetological Society shall select a suitable number of people to serve at his pleasure in an advisory capacity on the

Steering Committee. The people selected should be experienced and knowledgeable in talent that is conducive to the continued growth of the Maryland Herpetological Society. When deemed necessary the Steering Committee shall appoint interim officers to fill vacancies arising from unforseen events.

III. MEMBERSHIP

A. Membership shall be divided into three classes:

Junior members - shall have reached their thirteenth birthday;

Senior members - shall have reached their eighteenth birthday;

Subscribing members - of any age and residing in any place shall pay a fixed sum of money and receive only the official bulletin of the Maryland Herpetological Society;

Members shall pay the dues required by the Maryland Herpetological Society and shall receive the following benefits:

B. Membership in the Maryland Herpetological Society, the Natural History Society of Maryland and the Maryland Academy of Science, along with the publications of these organizations. They shall also have the use of designated space and the privilege of attending meetings, field trips, and any other function sponsored by the Maryland Herpetological Society and its affiliates. Junior and Senior members have an obligation to vote for the officers of their choice at the December meeting.

C. Illegal or undesirable actions against the good of the Maryland Herpetological Society, when reported to an officer of the Maryland Herpetological Society, shall be investigated by the officers who will report their findings and act upon the matter within thirty days of the initial report. Their findings may result in the censure or suspension of the member or members in question. Non-payment of dues shall result in immediate loss of all benefits and privileges.

IV. The Maryland Herpetological Society and the Natural History Society of Maryland shall work in a manner that will be mutually beneficial to each.

At no time shall either assume a position that will prove in any way detrimental to the other.

A. The Maryland Herpetological Society is bound by the existing Constitution and Laws of the Natural History Society of Maryland.

B. The Maryland Herpetological Society shall be financially aided by the Natural History Society of Maryland on a yearly basis and at other times upon mutual agreement. The Natural History Society of Maryland shall also provide the Maryland Herpetological Society with adequate mailing privileges, secretarial services, meeting space and laboratory space. Informal and formal meetings between the Maryland Herpetological Society and the Natural History Society of Maryland will take place at the formal request of either.

C. All written material distributed by the Maryland Herpetological Society shall bear the following inscription in a prominent place -

THE NATURAL HISTORY SOCIETY OF MARYLAND, INC.

Editor's Note:

The revision and republication of the Distribution Survey of Maryland and the District of Columbia is scheduled for the December 1973 issue of the Bulletin of the Maryland Herpetological Society as initially planned. Since its publication in December 1969, three new amphibians and reptiles have been recorded for the state. Numerous range extensions, new county records, etc. have also been reported. All copies of the survey have been exhausted for some time now, and new requests continue to pour in. I would also like to include the state of Delaware in this new revision.

Please check your data, and if you have any new material concerning the distribution of Maryland's amphibians or reptiles or any distribution data for Delaware, please send it to:

Herbert S. Harris, Jr.
Curator, Dept. Herpetology
Nat. Hist. Soc. Md., Inc.
2643 N. Charles Street
Baltimore, Maryland 21218

I will acknowledge all data received in the forth coming survey. With your help, we will try and make this revision of the Distributional Survey as complete as possible. Thank you.

HSH

Natural History Society of Maryland
Maryland
Herpetological
Society

REPTILES & AMPHIBIANS
U. S. NATIONAL MUSEUM

ISSN 0025-4231

BULLETIN OF THE
Maryland Herpetological Society

The Natural History Society of Maryland, Inc.

ENDANGERED AMPHIBIANS AND REPTILES OF MARYLAND : A SPECIAL REPORT

SEPTEMBER 1973 VOLUME 9, NUMBER 3

Bulletin of the Maryland Herpetological Society
Volume 9 Number 3 September 1973

Contents

ENDANGERED AMPHIBIANS AND REPTILES OF MARYLAND

by *Committee on Rare and Endangered Amphibians and Reptiles of Maryland,* Maryland Herpetological Society.........42

Library of Congress Catalog Card Number: 76-93458

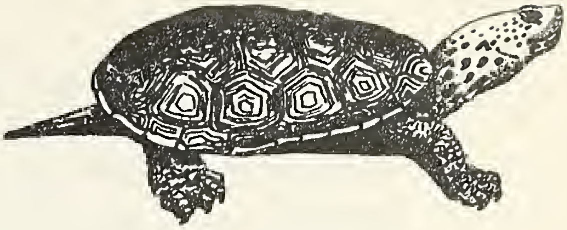
The Cover: An adult Hellbender, *Cryptobranchus a. alleganiensis*. *Photograph by* Jerry D. Hardy, Jr.

Ed. Note: Manuscripts being submitted for publication should be typewritten (double spaced) on good quality 8-1/2 by 11 inch paper, with adequate margins. Submit original and first carbon, retaining the second carbon. Indicate where illustrations or photographs are to appear in text. Cite all literature used at the end in alphabetical order by author. Reprints are available at $.01 a page ($.02 a page with photographs) and should be ordered when manuscripts are sent in. Minimum order 100 reprints.

MdHS.......a founder member of the Eastern Seaboard Herpetological League

The Maryland Herpetological Society, Department of Herpetology, Natural History Society of Maryland, Inc., 2643 North Charles Street, Baltimore, Maryland 21218.

BULLETIN OF THE mdhs



Volume 9 Number 3 30 September 1973

The Maryland Herpetological Society
Department of Herpetology, Natural History Society of Maryland, Inc.

Bulletin Staff

Executive Editor	Herbert S. Harris, Jr.
Associate Editors (this issue)	John Funk, Jr., Brian Leverton

Steering Committee

- John E. Cooper
- Frank Groves
- John D. Groves
- Jerry D. Hardy, Jr.
- Herbert S. Harris, Jr.
- Jeremy Jacobs
- Arnold Norden
- Mark J. Prihoda
- Margaret M. Thomas
- Peter Wemple

Officers

President	Brian Leverton
Vice-President	John Funk, Jr.
Secretary	Daniel Carver
Treasurer	William M. Marvel
Typist	Donna Marvel

Membership Rates

Active members over 18...$10.00, under 18...$6.00, subscribing members (outside a 20 mile radius of Baltimore City)...$3.00, Foreign...$4.00 per year.

Meetings

The third Saturday of each month, 9:45 a.m. at the Natural History Society of Maryland (Except May-Aug., 8:00 a.m.). The Department of Herpetology meets informally every Wednesday evening at the NHSM at 8:00 p.m.

ENDANGERED AMPHIBIANS AND REPTILES OF MARYLAND

Biologists have long known that the State of Maryland occupies a unique biogeographic position and that, in terms of fauna and flora, it is indeed "America in Miniature." This is quite evident in the herpetofauna of the state -- our native amphibians and reptiles -- which displays a great richness and diversity. Within the confines of our 12,327 square miles of land and water live no less than 20 types of salamanders, 18 frogs and toads, 6 lizards, 25 snakes, and 12 turtles. In addition, 5 species of giant pelagic turtles ply the seas of our coasts and visit our shores, and 2 other turtles, introduced here from further south, have taken up residence in some of our ponds, lakes, and rivers.

Unfortunately, as we have come to recognize in recent years, a number of these animals are threatened with extinction at the state level. Some of them exist in small, localized aggregations at the periphery of their natural distributions, quite probably in marginal conditions where man-made stresses could eliminate Maryland populations for all time. Others have already been greatly reduced, or are now directly threatened, by habitat alteration and destruction, pollution, over-collecting, and sale in the pet market.

Ecologists recognize that all living things, whether viewed as friend or foe, have inherent value above and beyond direct economic and aesthetic considerations. More than commodities for sale and consumption, more than beautiful creatures gracing our existence or frightening creatures which warrant destruction, our amphibians and reptiles are vital cogs in the living machinery of our ecosystems, the very systems that support human life itself. Their preservation is not only a wise resource investment and a non-negotiable moral obligation, but, considering the high probability that the stability of ecosystems depends on the diversity present in living communities, their protection is a long-term necessity for our own survival.

The 1971 Maryland General Assembly, in a far-sighted move which was practically a pioneer effort in the United States, passed an Endangered Species Act (see Appendix) which charged the Department of Natural Resources with preserving and protecting "Fish and Wildlife established as threatened with statewide extinction." This law set an ecologically important precedent in broadening the definition of "Fish and Wildlife" beyond the usual economically important game species to include "any species or subspecies of any mammal, fish, wild bird, amphibian, reptile, mollusk or crustacean." On March 1, 1972, the first official list of Maryland Endangered Species, containing seven mammals, was issued by the Honorable James B. Coulter, Secretary of Natural Resources.

The original report on endangered herpetozoa which gave rise to this issue of the *Bulletin* was prepared during the summer of 1972 by the Committee on Rare and Endangered Amphibians and Reptiles of Maryland, an *ad hoc* committee of the Maryland Herpetological Society. It was formulated to recommend the addition of 14 members of the Maryland herpetofauna, recognized as endangered within the confines of the state, to the endangered list, pursuant to the provisions of Article 66C, Section 125(c), Annotated Code of Maryland, and to provide supportive evidence for such a move. The report, concerning 9 members of the indigenous Maryland fauna and 5 marine turtles (one of them known to have deposited eggs on our shores), was officially transmitted to Mr. Ralph Bitely, Administrator, Wildlife Administration, Department of Natural Resources, on August 28, 1972. On October 12, 1972, the Secretary of Natural Resources accepted all of the committee's recommendations and issued an order amending the Endangered Species List to include these amphibians and reptiles. Mr. Bitely and Secretary Coulter are to be commended for the speed with which they acted in the best interests of Maryland wildlife. They have continued to be receptive to suggestions and ideas, and are cooperating with the Maryland Herpetological Society to develop plans for protection and study of the endangered species.

In addition to those amphibians and reptiles recommended for immediate inclusion in the endangered species list, five others were discussed in the report (a siren, an anuran, and three snakes). These animals are either exceedingly rare, possibly already extinct in the state, or currently in a situation where they would be endangered if certain habitat alterations were to occur.

It must be recognized that our knowledge of the distribution and ecology of Maryland amphibians and reptiles is still far from complete. A great deal of time-consuming field and laboratory adjunct work remains to be done to ensure a fuller assessment of our ecological base, natural resources, and environmental assets in herpetological and other faunal areas. Much, if not most, of the past work which has provided the foundation for our present understanding of the Maryland herpetofauna is the result of random collecting or regional surveys conducted by highly competent naturalists whose time was limited by the necessity of making a living in other fields, by professional biologists whose main duties lay elsewhere, and by teachers and students at several levels. The incomplete state of the art with respect to even such basic data as a state list is reflected in the fact that at least 3 members of the Maryland herpetofauna, and possibly a fourth, have been discovered here in the past 6 years. One of these came to light within the past 2 years. We are faced with a dearth of observational and experimental data on population densities and structure, home range, territoriality, reproduction, survivorship, predation, food habits, and other such ecological and ethological parameters. These data are essential if intelligent planning for the environmental and economic future of Maryland is to be accomplished. We cannot determine where we are going unless we can measure our plans and our actions against such base-line information.

ACCOUNTS OF ENDANGERED SPECIES

These accounts of species are presented in phylogenetic order, following the *Distributional Survey: Maryland and the District of Columbia* (Cooper, 1960, *Bull. Phila. Herp. Soc.*, May-June: 18-24; Harris, 1969, *Bull. Md. Herp. Soc.*, 5(4):97-161). Scientific names are those in usage in the current herpetological literature, and common names conform to the list of *Common Names for North American Amphibians and Reptiles* published by the American Society of Ichthyologists and Herpetologists (1956, *Copeia*, No. 3: 172-185). Pertinent selected references, most of them concerned only with Maryland, are given at the end of each discussion. Much of the information presented, however, is based on unpublished data.

1. *Cryptobranchus alleganiensis alleganiensis* (Daudin). Hellbender.

Distribution: This unique salamander, one of the two largest salamanders in North America and a close relative of the largest amphibian in the world (a giant Asiatic salamander), is known in Maryland from portions of the Youghiogheny and Casselman Rivers in Garrett County. Literature records for the Susquehanna River, and undocumented local accounts, most of them quite old, indicate that the species was at one time present in this river between Cecil and Harford Counties. It may yet survive there, but accurate and reliable recent data are lacking. Further north, in Pennsylvania and New York, it occurs in the Susquehanna and its tributaries.

Abundance: Rare. In areas where it was once locally common it is now hard to find or lacking.

Habitat Requirements: Found in clear rivers and large streams. Most common in fairly swift water a foot or two in depth. Nocturnal in movements and requiring large rocks, essentially flat, to hide under during the day. Apparently these diurnal retreats are often defended.

Home Range: Average mean activity radius for a population studied in Pennsylvania was 10.5 m (Hillis and Bellis, 1971). They appear to defend a limited territory as well.

Reproductive Potential and Survivorship: In late summer and fall nests are excavated under large, flat rocks. Once the long, bead-like strings of eggs are fertilized, the female departs, leaving the male to guard the nest site. Fowler (1950) first observed the eggs of this salamander in Maryland on September 3, 1949 in the Casselman River. They had been recently deposited. Egg rosaries, some containing several hundred individual eggs, were observed in the Casselman-US 40 area up through September, 1966, but have not been seen in the area since that time. Survivorship may be high because of guardianship of the nest site, but there is no information whatever on the larval development of this species in Maryland. The eggs doubtless occasionally fall prey to aquatic scavengers.

Food Habits: Nothing is known of the feeding habits of *Cryptobranchus* in Maryland. At some localities in its range it feeds primarily on crayfish. In at least one locality in north Alabama feeding appears to be highly species-specific on crayfish (Cooper, unpublished). Bishop (1941) also records molluscs, worms, insects, some fish, and animal refuse in the diet of the species.

Status and Problems: The hellbender was once locally abundant in the Casselman River near the U. S. 40 bridge, but overcollecting, construction activities, and/or pollution of the river have so reduced the size of this population that today the species is rare at this site. A complete day and night search of the area in September, 1972, did not reveal a single specimen. Water quality here has apparently deteriorated greatly as a result of pollutant influx, although no quantitative data are yet available. Large numbers of specimens have been collected in the past from this location for medical experimentation. Portions of the Youghiogheny River, and possibly also the Susquehanna, harbor *Cryptobranchus*, but these populations are probably marginal at best. Since the hellbender appears to have little tolerance for siltation, the construction of the Interstate Highway over the Casselman may very well be disastrous to any that remain. Effect on population size and structure by recent flooding of the three rivers mentioned above as a result of Tropical Storm Agnes is yet to be assessed.

References:

BISHOP, Sherman C. 1947. Handbook of Salamanders. Comstock Publishing Company, Ithaca, New York. 555 pp.

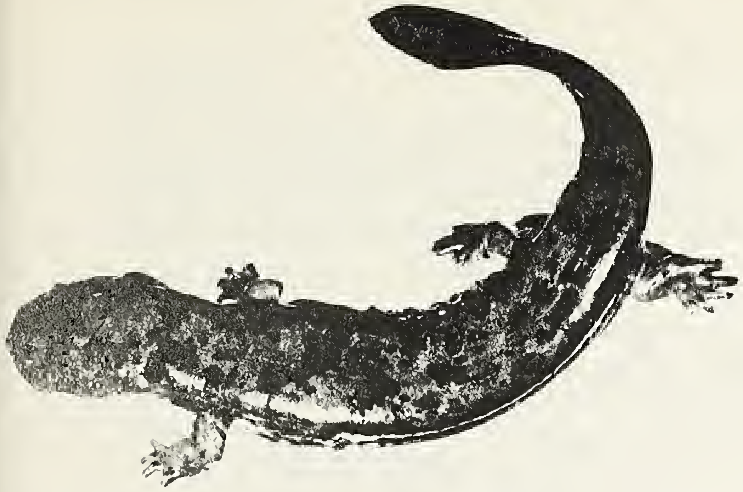
DUNDEE, Harold A. 1971. *Cryptobranchus alleganiensis* (Daudin). Cat. Amer. Amphib. Rept.:101.1-101.3.

FOWLER, Henry W. 1915. Some amphibians and reptiles of Cecil County, Maryland. Copeia 22:37-40.

FOWLER, James A. 1947. The hellbender (*Cryptobranchus alleganiensis*) in Maryland. Maryland, A Journal of Natural History, XVII(1):14-17.

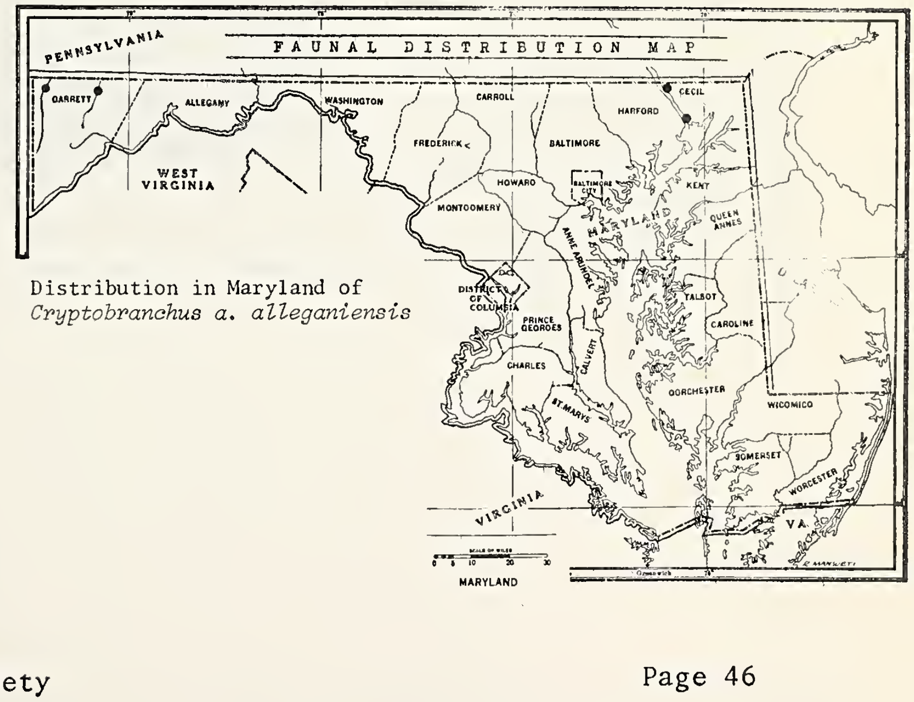
__________. 1950. A record for the eggs of *Cryptobranchus alleganiensis* in Maryland. Md. Naturalist, XX(4):71-75.

HILLIS, R. E. and E. D. Bellis. 1971. Some aspects of the ecology of the hellbender, *Cryptobranchus alleganiensis alleganiensis* in a Pennsylvania stream. J. Herpetology, 5(3-4):121-126.



Cryptobranchus a. alleganiensis

Typical habitat of *Cryptobranchus* along the Casselman River, Garrett County, Maryland



Distribution in Maryland of *Cryptobranchus a. alleganiensis*

2. *Ambystoma jeffersonianum* (Green). Jefferson Salamander.

Distribution: Very localized within the Appalachian Province. Only four breeding ponds have been located: near Thurmont, Frederick County; near Indian Springs, Washington County; and near Flintstone and Frostburg, Allegany County. The population near Indian Springs is unique in that it contains a large number of albinos (Harris, 1967).

Abundance: Adults are uncommon at all sites throughout the year, but most abundant in breeding aggregations in March and April. Larvae may be found in the ponds through mid-summer, and transforming individuals into early Autumn.

Habitat Requirements: Breeding sites are usually shallow ponds in open areas, including old field ponds, sinkhole ponds, ironpits, and stripmine pools if not too acidic. Adults migrate from surrounding woodlands during warm nocturnal rains in Spring, sometimes for considerable distances. Their habits during the rest of the year are essentially unknown, but they probably live underground in crevices and mammal burrows where moisture-loss is minimized.

Home Range: Little is known about the areal range requirements of this species, but, as mentioned, the adults migrate considerable distances to and from breeding ponds. They are often killed by automobiles while crossing highways constructed between their non-breeding habitats and the ponds.

Reproductive Potential and Survivorship: Females may lay two egg masses, each containing from one to 35 eggs (mean 14). Simmons and Stine counted 100 egg masses in the Indian Springs pond in March, 1953. Several authors indicate a high percentage of egg success. The incubation period varies from 30 to 45 days, with metamorphosis occurring from late May through June in Maryland. Data on survivorship are not available for Maryland, but the larvae do have several natural predators.

Food Habits: Adults are known to feed on earthworms, mature and larval insects, millipedes, and spiders. The larvae, of course, are aquatic feeders, subsisting on Entomostraca, insects, and worms. There is some evidence that the larvae also may be cannibalistic.

Status and Problems: Many man-hours in the field have produced only four known breeding colonies. One of these has apparently been destroyed by the new Route 40 Bypass at Frostburg, and another is endangered by housing encroachment at Indian Springs. The initial Maryland specimens (Netting, 1946) came from Carlos (= Midlothian), but no specimens have since been recorded from this stripmine area. The remaining breeding ponds, and surrounding habitat, must be protected if this salamander is to survive in Maryland.

References:

BISHOP, Sherman C. 1947. Handbook of Salamanders. Comstock Publishing Company, Ithaca, New York. 555 pp.

HARRIS, Herbert S., Jr. 1967. Albinism in the Jefferson Salamander, *Ambystoma jeffersonianum* Green. Bull. Md. Herp. Soc., 3(4):99-100.

NETTING, M. Graham. 1946. Jefferson's salamander in Maryland. Maryland, A Journal of Natural History, XVI(3):60-61.

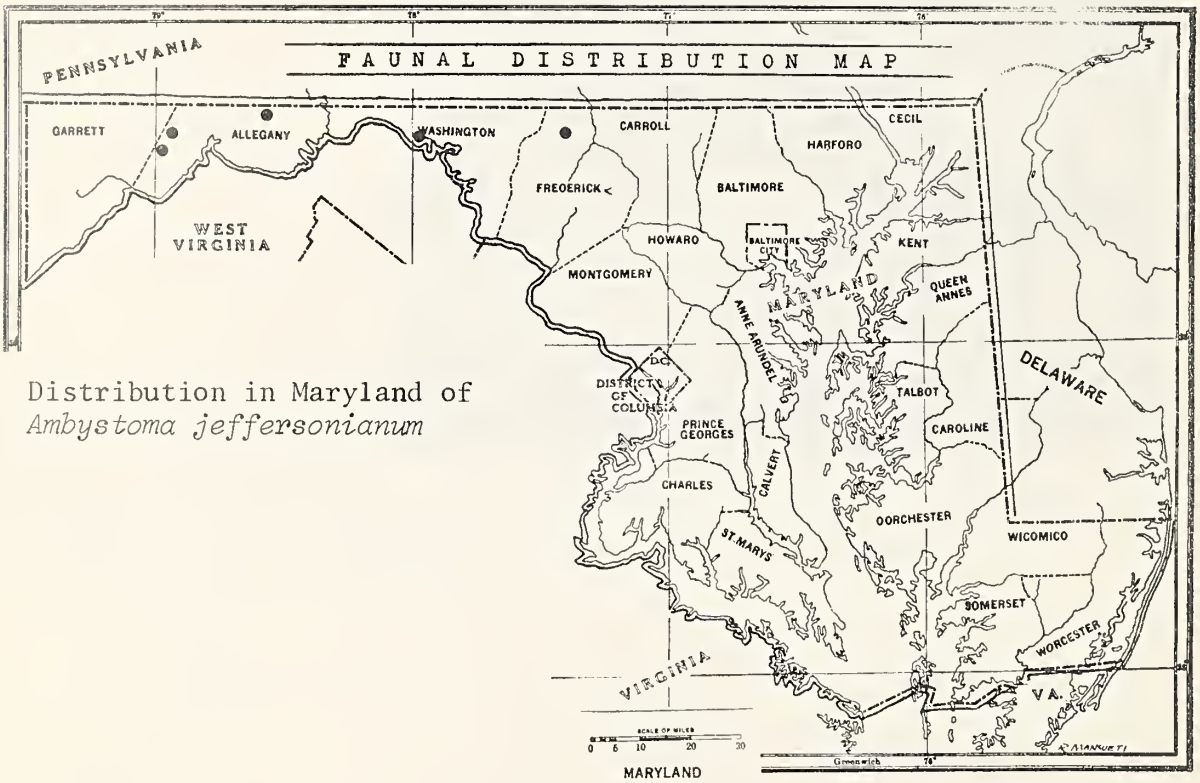
STINE, Charles J. 1953. Maryland salamanders of the Genus *Ambystoma*. Md. Naturalist, XXIII(1-2):75-78.

__________ and R. S. Simmons. 1952. A new county record for Jefferson's salamander in Maryland. Md. Naturalist, XXII(3-4):45-47.

UZZELL, Thomas. 1967. *Ambystoma jeffersonianum* (Green). Cat. Amer. Amphib. Rept.:47.1-47.2. ASIH.

Ambystoma jeffersonianum

A typical *A. jeffersonianum* breeding pond (Nr. Indian Springs, Washington County, Maryland)



Distribution in Maryland of *Ambystoma jeffersonianum*

3. *Ambystoma tigrinum tigrinum* (Green). Eastern Tiger Salamander.

Distribution: Known almost exclusively from nine Eastern Shore localities, in Kent, Queen Annes, Caroline, Dorchester, and Worcester Counties. However, only two Eastern Shore breeding ponds utilized by a significant population are known, one near Massey and the other at Golts, both localities in Kent County. Eggs were found in 1941 at Hollingsworth Crossroads and in 1946 at Federalsburg, both in Caroline County, and a single cluster at Carson's Corner, Queen Annes County. Nothing additional is known of the status of these occurrences. A single specimen has been collected at Pines-on-the-Severn, near Arnold, Anne Arundel County, but no suitable breeding ponds can be located in this developed area. One breeding pond was discovered on May 27, 1953, near LaPlata, Charles County, but the pond has since been destroyed (see comments below under "Status and Problems").

Abundance: In Maryland this large salamander is uncommon and very local. Precise information on population size in the only currently known breeding areas, at Golts and Massey, are not available. It is estimated that, at best, 100 adults utilize the Massey Pond at any one time. The highest field count to date, 26 individuals, was made in March, 1969.

Habitat Requirements: Adults are seldom ever seen except at breeding ponds in winter. They move nocturnally, arriving during mid and late January at these ponds, which are essentially transient field ponds in depressions located very close to hardwood forests with dense understory. Not much is known about the habits during non-breeding periods except that they are apparently fossorial and solitary, and probably inhabit the woodlands. Larvae, of course, develop and transform in the field ponds. These ponds must contain submerged grasses, twigs, and other debris to which the females attach their egg masses.

Home Range: No specifics are available. Adults migrate to and from breeding ponds, but the distances of migration are not clear.

Reproductive Potential and Survivorship: An individual female is known to have layed approximately 300 eggs in oblong masses of 17 to 92 eggs each. The eggs mature rapidly and, depending on the water temperature, hatch in about 36 days. Larvae reach full size in the last week of May, with metamorphosis occurring during the last half of June. The scheduling may vary in years of unusual winter climate oscillations. In such instances, breeding may occur as early as December, and as late as March. Nothing much is known about survivorship. The pond at Massey is inhabited by bullfrogs, *Rana catesbeiana*, which are known to eat larval salamanders, and a family of pied-billed grebes, *Podilymbus podiceps*, a bird which feeds on aquatic organisms, has been observed to nest there. Possible predatory birds observed at the Golts pond include a hooded merganser, *Lophodytes cucullatus*, and black ducks, *Anas rubripes tristis*.

Food Habits: Earthworms appear to be a common food item for captive adults (Stine, Fowler, and Simmons, 1954). The larvae are wide spectrum carnivores, and small larvae feed on zooplankton (Dodson and Dodson, 1971). One local study indicates that mature larvae are largely opportunistic feeders on aquatic insects, crustaceans, and tadpoles (Lee and Franz, 1973).

Status and Problems: The highly specialized breeding habitus and apparently small, localized populations make *A. tigrinum* a vulnerable species. Direct destruction of breeding ponds, or changes in the combined pond-woodland ecological relationship, could locally exterminate this salamander. Since only two major breeding ponds are currently known, the situation in Maryland appears to be tenuous. The Western Shore breeding pond discovered near La Plata, Charles County, in May, 1953, was filled and bulldozed in late 1963 during construction of a golf course. There are currently no breeding populations known in the Inner Coastal Plain of Maryland. Steps must be taken to protect the remaining ponds on the Eastern Shore. These ponds have great ecological and educational value since they also support breeding populations of other amphibians.

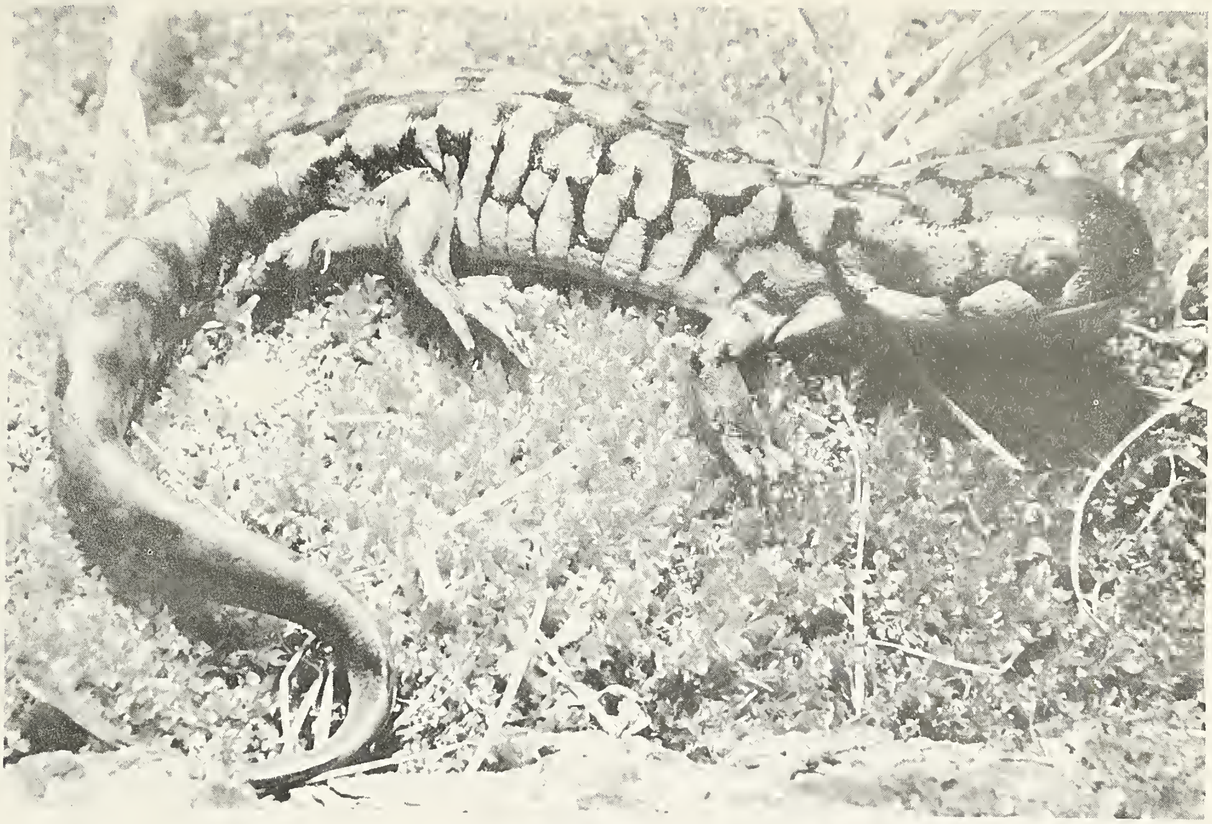
References:

DODSON, Stanley I. and V. E. Dodson. 1971. The Diet of *Ambystoma tigrinum* larvae from Western Colorado. Copeia (4):614-624.

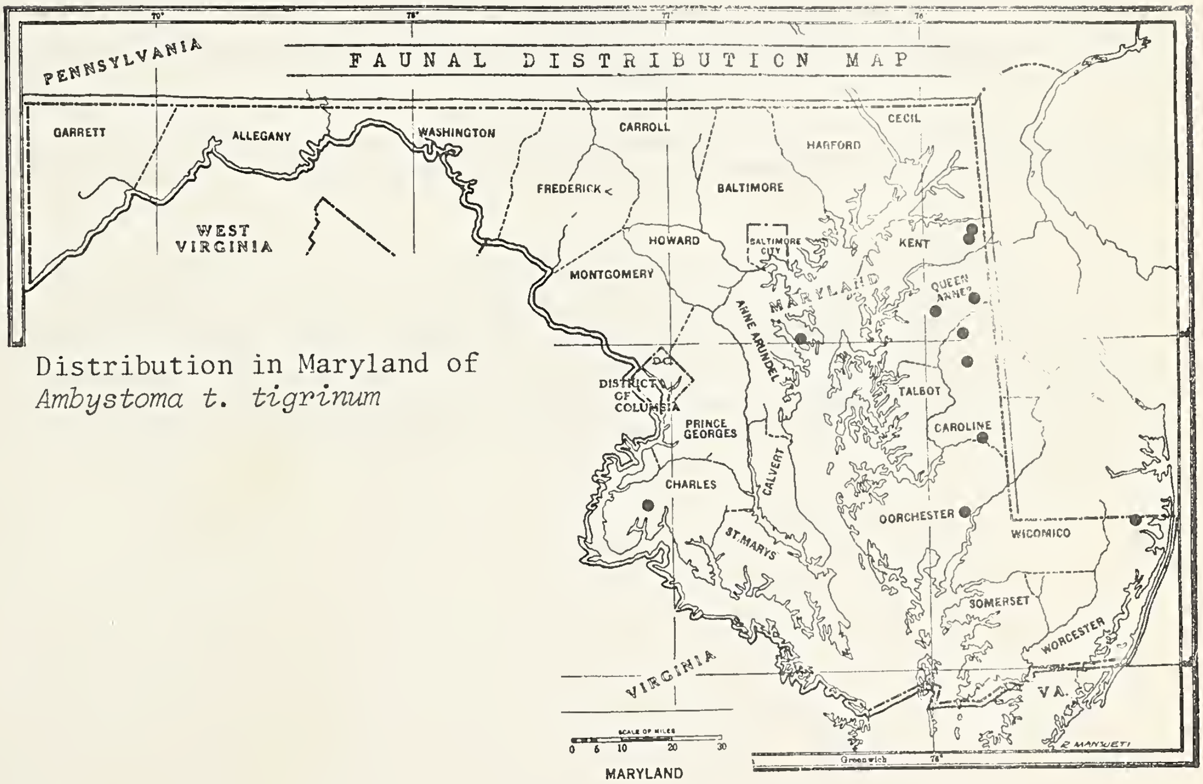
LEE, David S. and L. R. Franz. 1973. Comments on the feeding behavior of larval tiger salamanders, *Ambystoma tigrinum*. In press.

STINE, Charles J. 1953. Maryland salamanders of the genus *Ambystoma*. Md. Natur., XXIII(1-2):75-78.

__________, J. A. Fowler, and R. S. Simmons. 1954. Occurrence of the eastern tiger salamander, *Ambystoma tigrinum tigrinum* (Green) in Maryland, with notes on its lifehistory. Ann. Carnegie Mus., XXXIII(7):145-148.



Ambystoma t. tigrinum



Distribution in Maryland of
Ambystoma t. tigrinum

4. *Aneides aeneus* (Cope and Packard). Green Salamander.

Distribution: The presence of *Aneides* in Maryland was first discovered in September, 1966 (Harris and Lyons, 1968a and b). It is known only from extreme western Garrett County, where two small populations exist in the Pottsville Sandstone, one at "House Rocks" (1.3 mis. SW of Youghiogheny River bridge on the Sang Run-Cranesville Road), and the other off River Road ca. 1.3 mis. NNW of the Sang Run-Cranesville Road.

Abundance: Due to the limitations of its microhabitat, *Aneides* is extremely localized and is nowhere abundant. Although the sandstone at "House Rocks" covers a fairly large area, it is generally dry and only a few crevices appear to offer environmental conditions sufficient to support *Aneides*. The River Road locality is generally quite humid, and the salamander may currently be considered fairly common there.

Habitat Requirements: Shaded sandstone outcroppings with damp but not saturated crevices. In the known localities, most immediate shade is provided by *Rhododendron maximum*.

Home Range: Nothing known for Maryland populations. Breeding antics have been observed in crevices and on exposed sandstone surfaces; some territoriality may be involved. Individuals have been repeatedly seen in the same crevices.

Reproductive Potential and Survivorship: Dissection of five females revealed 30, 25, 32, 20, and 20 ova, ostensibly mature. Females have been recorded as depositing 10 to 16 eggs in clusters, and eggs have been found from June to September. The eggs are guarded, and survival is probably high. Attainment of sexual maturity may require 3 to 5 years.

Food Habits: A study by Lee and Norden (1973) reveals that *Aneides* is an opportunistic and somewhat generalized feeder on small arthropods, notably insects.

Status and Problems: *Aneides*, as indicated, is a very localized species in Maryland, with narrow ecological requirements. The most productive site, that along River Road, has been cleared and leveled to the edge of the Pottsville Sandstone. This may well affect the microclimate and ecology of the habitat, and consequently have an adverse effect on the *Aneides* population there. Destruction of this population would leave Maryland with a single locality for the species.

References:

CUPP, Paul V., Jr. 1971. Fall courtship of the green salamander *Aneides aeneus*. Herpetologica, 27(2):308-310.

GORDON, Robert E. 1952. A contribution to the life history and ecology of the plethodontid salamander *Aneides aeneus* (Cope and Packard). Amer. Midl. Natural., 74(3):666-701.

GORDON, Robert E. 1967. *Aneides aeneus* (Cope and Packard). Cat. Amer. Amph. Rept.:30.1-30.2. ASIH.

HARRIS, Herbert S., Jr. 1969. Distributional Survey: Maryland and the District of Columbia. Bull. Md. Herp. Soc., 5(4):97-161.

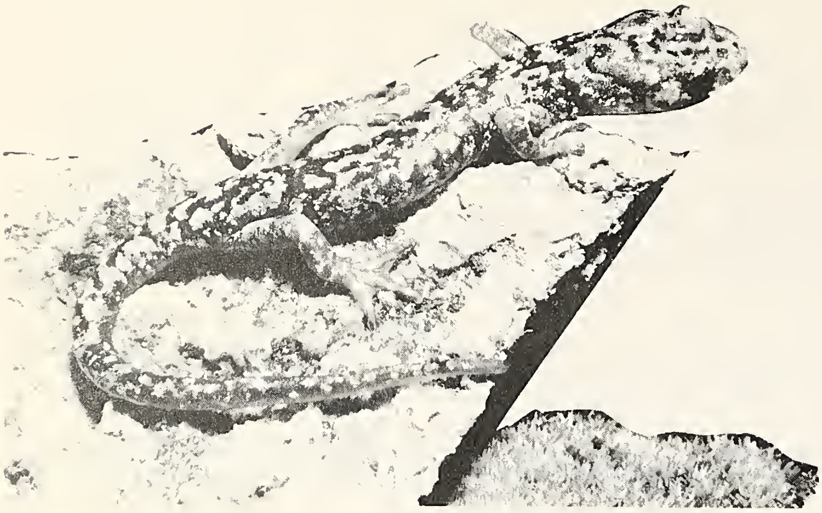
__________ and D. Lyons. 1968a. The first record of the green salamander, *Aneides aeneus* (Cope and Packard) in Maryland. J. Herpetology, 1(1-4):106-107.

__________ and __________. 1968b. The green salamander, *Aneides aeneus* (Cope and Packard) in Maryland. Bull. Md. Herp. Soc., 4(1):1-6.

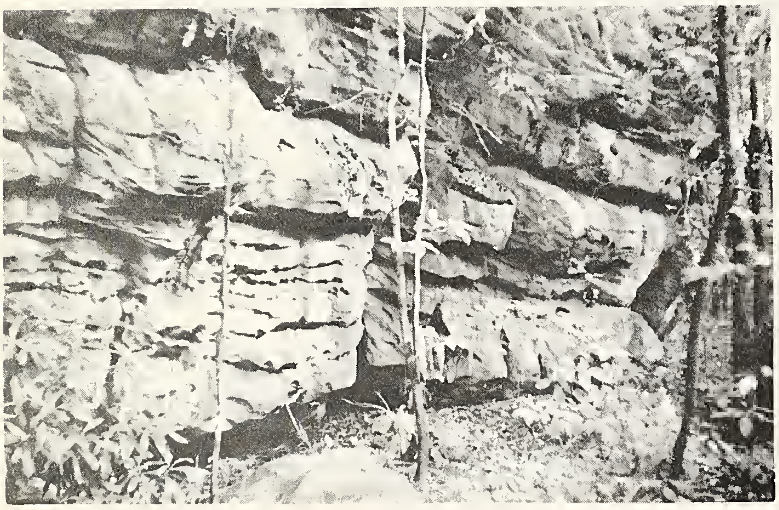
LEE, David S. and A. Norden. 1973. A food study of the green salamander, *Aneides aeneus*. J. Herpetology, 7(1):53-54.

LYONS, Daniel. 1972. Animals new to Maryland: the green salamander. Md. Conservationist, 48(7):8-12.

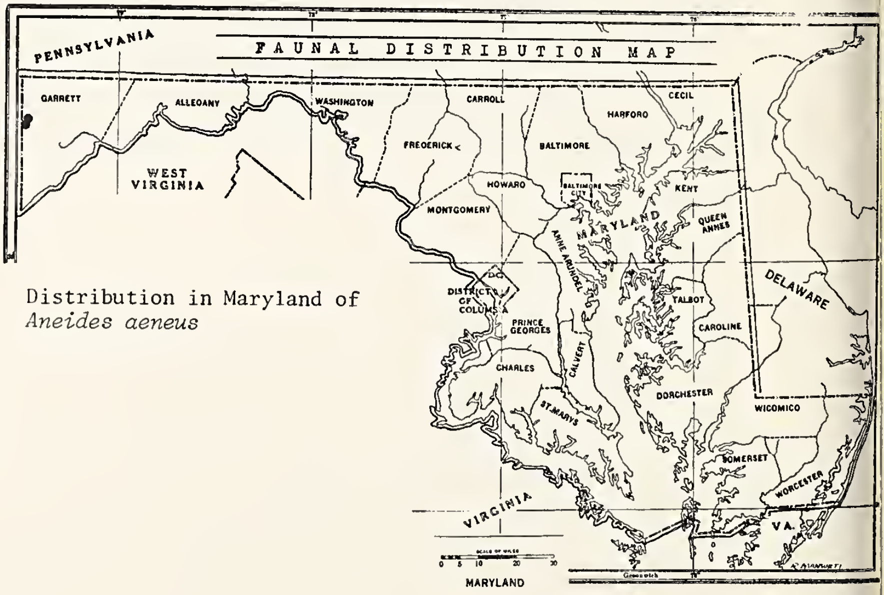
STINE, Charles J. 1967. A new Maryland animal find. Balto. Sunday Sun, September 17, 1967.



Aneides aeneus



Pottsville sandstone formation;
the habitat of *Aneides aeneus*
(Garrett County, Maryland)



Distribution in Maryland of
Aneides aeneus

5. *Gastrophryne carolinensis* (Holbrook). Eastern Narrow-mouthed Toad.

Distribution: The occurrence of this unusual anuran in Maryland was first reported in the literature 37 years ago (Noble and Hassler, 1936). For many years it was known only from Cove Point, and a pond between Cove Point and Solomons, both localities in southern Calvert County. It is apparently extinct at the latter locality, and extinct or nearly extinct at Cove Point. A single specimen has been reported from near Great Mills, St. Mary's County (Fowler and Stine, 1953) and one from Taylor's Island, Dorchester County (Conant, 1958). Two other possible Eastern Shore localities are being investigated. The Maryland Coastal Plain is the northern limit of the range of this species.

Abundance: Formerly abundant and widespread in the Cove Point area, occurring both on the Point itself and in the surrounding forest. This population has declined in the last few years and may well now be extinct (see remarks under "Status and Problems"). Density and abundance at the two other published localities is completely unknown.

Habitat Requirements: Gastrophryne is an amphibian of both forested and open country. It is usually found in or under rotten logs, dead vegetation, and other surface debris, or in or near ant nests. Moisture and ground cover are both critical habitat requirements. In some non-Maryland areas population densities are known to fluctuate with changes in the depth of organic debris. Under dry conditions, the frogs are even known to fall prey to *their* natural prey -- ants. The species breeds in a variety of aquatic situations, including woods ponds, barrier beach ponds, cat-tail marshes, ditches, and puddles. Successful breeding depends on the presence of dense vegetation in the breeding site, or a sufficient number of sticks, earth lumps, or crevices to permit calling males to perform courtship activities.

Home Range: Gastrophryne is a rather solitary, secretive species, and apparently stays relatively close to breeding ponds. Adults are known to return to the site of ponds which have been destroyed by human agencies. Calling patterns suggest that there is a complex social relationship between individuals in a single breeding population.

Reproductive Potential and Survivorship: The breeding season lasts from May to September. Females produce from 152 to 1,089 eggs, average about 510. The incubation period is very short, 1 1/2 to 3 days, with transformation occurring in 16 to 67 days. Although hatching success is probably high, neither this nor tadpole survival has been adequately studied.

Food Habits: Gastrophryne appears to be a highly specialized feeder, with ants making up the bulk of its diet. Small beetles and termites have also been recorded.

Status and Problems: The species depends on moisture, ground cover, abundance of ants, and suitable breeding ponds for survival, and is apparently more sensitive to habitat changes than most anurans. Destruction of habitat is the primary source of danger for the species. The Cove Point population has declined rapidly since the construction of the Cove Point community, although all other local species of frogs are still abundant in the area. The decline appears to have been the result of ground cover removal and destruction of large ant colonies. Concurrently a number of breeding ponds were destroyed, with only a single site remaining in 1970. This pond has recently been bull-dozed and the surrounding area carefully cleared of surface debris. *Gastrophryne* has not been seen at Cove Point since that time.

References:

ANDERSON, Paul K. 1954. Studies in the ecology of the narrow-mouthed toad, *Microhyla carolinensis carolinensis*. Tulane Studies Zool., 2(2):15-46.

CONANT, Roger. 1958. Notes on the herpetology of the Delmarva Peninsula. Copeia, (1):50-52.

FOWLER, James A. and C. J. Stine. 1953. A new county record for *Microhyla carolinensis carolinensis* in Maryland. Herpetologica, 9(4):167-168.

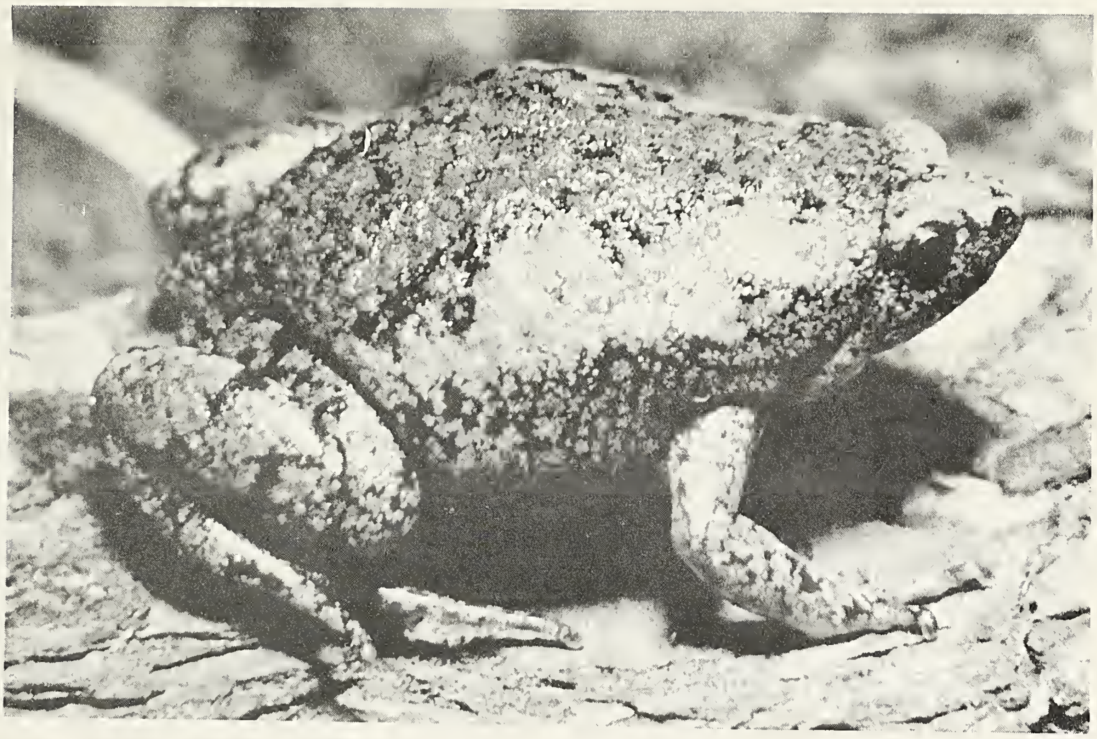
HARDY, Jerry D., Jr. 1953. Notes on the distribution of *Microhyla carolinensis* in southern Maryland. Herpetologica, 8(4):162-166.

HOLMAN, J. Alan and H. Campbell. 1958. An interesting feeding activity of *Microhyla carolinensis*. Herpetologica, 14(4):205.

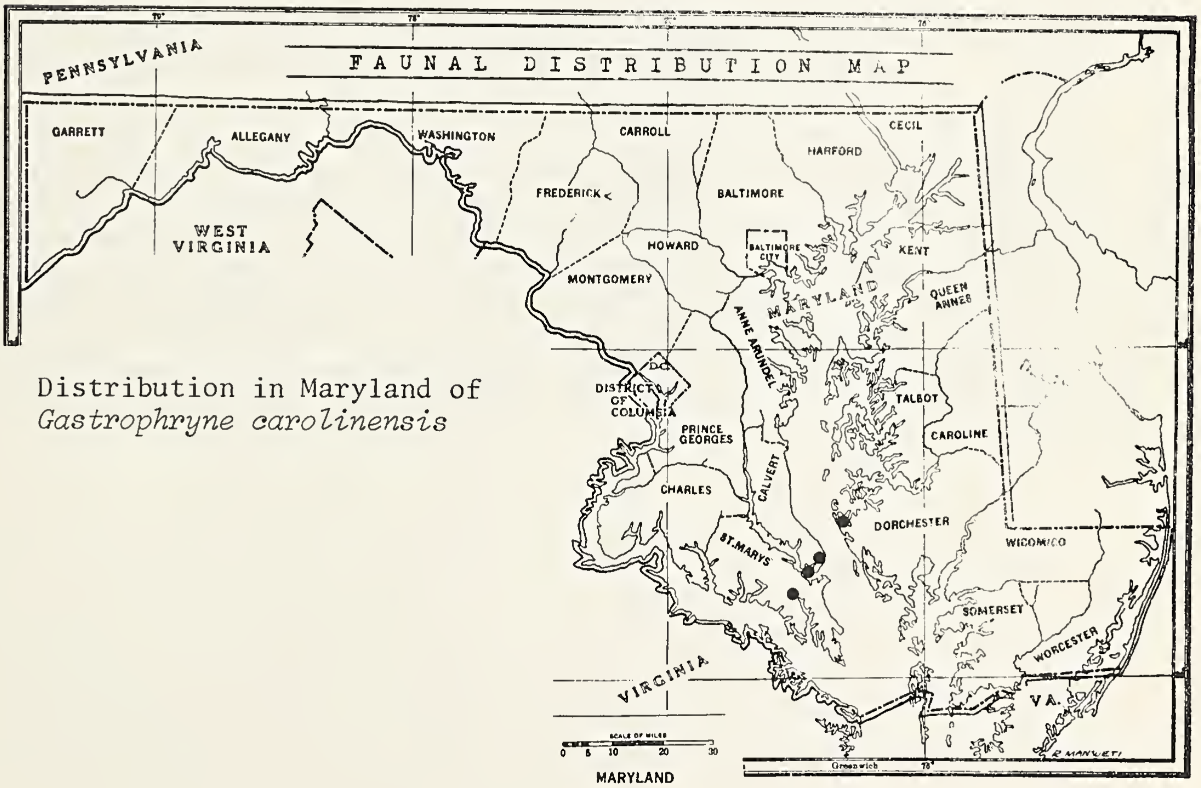
NELSON, Craig E. 1972. *Gastrophryne carolinensis* (Holbrook). Cat. Amer. Amph. Rept.:120.1-120.4. ASIH.

NOBLE, G. K. and W. G. Hassler. 1936. Three salientia of geographic interest from southern Maryland. Copeia (1):63-64.

WOOD, John T. 1948. *Microhyla c. carolinensis* in an ant nest. Herpetologica, 4(6):226.



Gastrophryne carolinensis



Distribution in Maryland of
Gastrophryne carolinensis

6. *Eumeces anthracinus anthracinus* (Baird). Northern Coal Skink.

Distribution: This, the rarest of our native lizards, is very limited in distribution in the state. Like the endangered snake, *Virginia valeriae pulchra,* the coal skink has only been verified from several localities in and near the Swallow Falls Park, Garrett County. The only recorded localities are "Moss Fields" along Maple Glade Road, and several small areas along Cranesville Road. It has been sought but not found in similar habitats in other parts of Garrett County. Despite two old specimens in the collections of the Academy of Natural Sciences of Philadelphia, labeled simply "Allegany County," no specimens have been found outside the Swallow Falls Park area in Maryland.

Abundance: This is a rare reptile throughout its range, and it is especially rare in Maryland, where few specimens have been seen.

Habitat Requirements: Found under surface cover, and in rocky soil, in situations ranging from moist areas in forests to completely wet, open areas in a bog where small mounds of earth alternate with pools of water. As with *Virginia v. pulchra,* habitat requirements appear to be stringent.

Home Range: No information.

Reproductive Potential and Survivorship: Females coiled around eggs in shallow depressions under cover have been found on two occasions, one with 10 eggs (12.5 - 14.0 mm) and the other eight (Cooper, unpublished). One of the specimens reported by Lemay and Marsiglia (1952) contained seven eggs. Egg success is probably high, with hatching occurring in mid-summer.

Food Habits: No studies of Maryland populations have been done due to the rarity of the species. Elsewhere it is known to feed on insects and insect larvae.

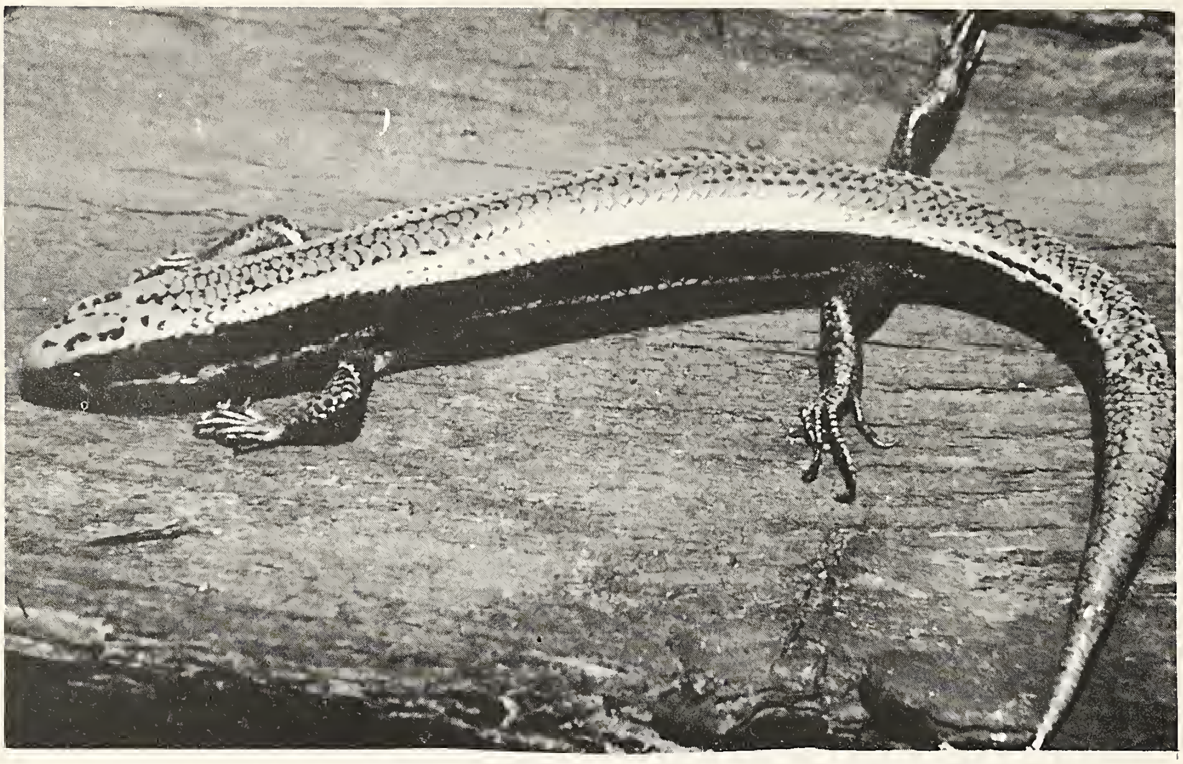
Status and Problems: This is a species with localized and very limited distribution, stringent habitat requirements, and small populations. One of its primary localities, "Moss Fields," has experienced extensive logging of the surrounding hardwood forest and an attempt at some replacement with a pine monoculture. In addition, trenches have been dug adjacent to the "Moss Fields" in an apparent effort to drain off the surface water. These acts do seriously threaten the survival of both *anthracinus* and *pulchra.* It is of interest that on September 15, 1966, an adult *anthracinus* was found dead under a rock at "Moss Fields," and the previous year a dead juvenile was found in a similar situation at the same locality.

References:

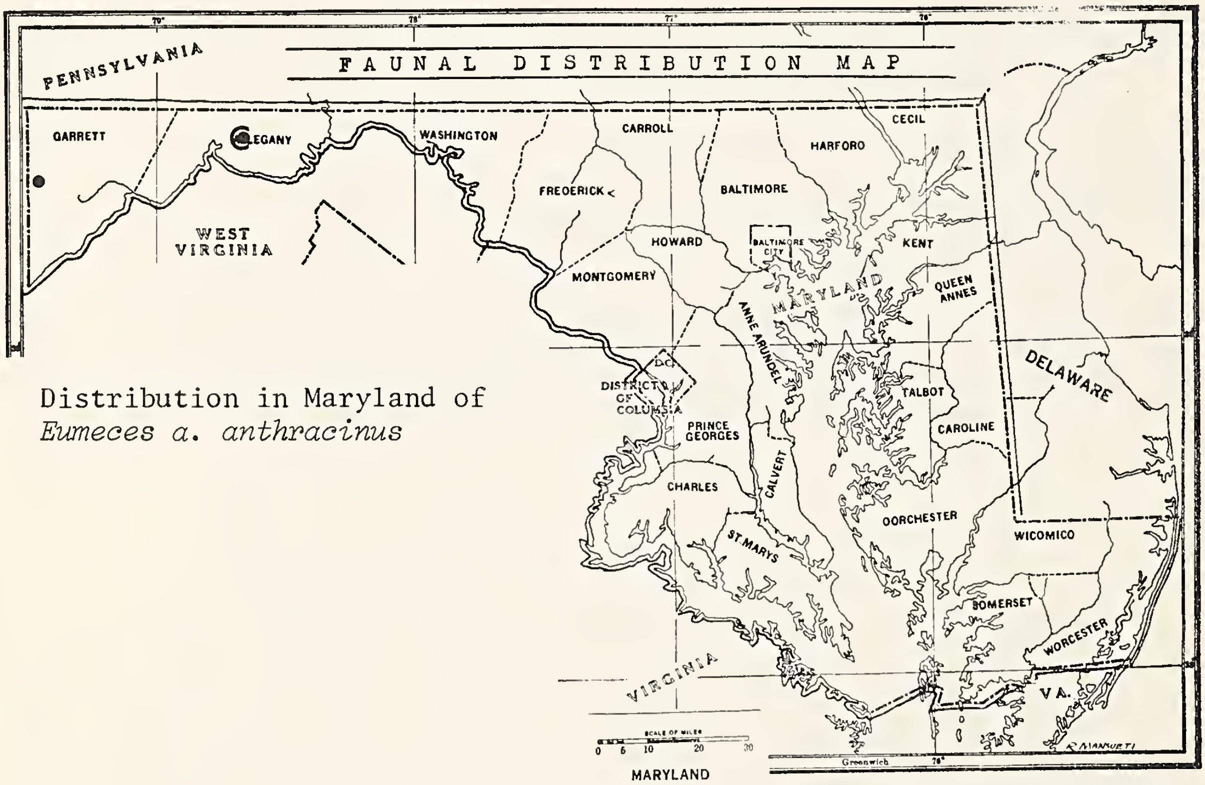
LEMAY, Leo and A. G. Marsiglia. 1952. The coal skink, *Eumeces anthracinus*, in Maryland. Copeia, (3):193.

MC CAULEY, Robert H. 1945. The Reptiles of Maryland and the District of Columbia. Pub. by author, Hagerstown, Md. 194 pp.

SMITH, Hobart M. 1946. Handbook of Lizards. Comstock Publishing Company, Ithaca, New York. 557 pp.



Eumeces a. anthracinus



Distribution in Maryland of
Eumeces a. anthracinus

7. *Farancia erytrogramma erytrogramma* (Latreille). Rainbow Snake.

Distribution: Only four specimens of this rare, fossorial snake have been reported from Maryland, three from Stump Neck near Indian Head, Charles County (McCauley, 1939), and one from near Newburg, Charles County (Cooper, 1960).

Abundance: Apparently quite rare; population densities undoubtedly low. Extensive collecting (including night collecting) at the only known recent locality has failed to yield specimens.

Habitat Requirements: In Maryland, the northern limit of its range, this snake apparently lives in very sandy, marshy lowlands of the Potomac River where it burrows and follows a secretive mode of life. The three original specimens were collected in July, 1932, by Civilian Conservation Corps workers building roads on Stump Neck, between Mattawoman and Chicomuxen Creeks. The first was dug from sandy soil in a swampy area, and the second and third were found under stumps. The only recent specimen was found dead on the sandy shoulder of U. S. 301 near the Potomac River bridge, apparently struck by an auto. This locality lies on a narrow peninsula between the Potomac and Wicomico Rivers, and tributary streams from Allens Fresh Run and Clifton Creek enter the immediate area. Extensive root systems in and along the streams, and crayfish burrows, provide potential concealment.

Home Range: No information available.

Reproductive Potential and Survivorship: No precise data are available from Maryland, but in Virginia eggs are deposited in a large, oval cavity about four to six inches below ground surface (Richmond, 1945). Apparently females may lay as many as 50 eggs, with the number being quite variable. The nests are known to be subject to predation from skunks, and are doubtless molested by other animals. (See other comments under "Status and Problems".)

Food Habits: No food data available for any of the Maryland specimens. The stomach of the specimen found dead-on-road was empty. Elsewhere the snake is known to feed extensively on eels, *Anguilla rostrata,* and also on large, elongate salamanders like *Amphiuma* (not found in Maryland). *Anguilla* is abundant at the Newburg locality.

Status and Problems: Although the exact condition of its populations in Maryland is impossible to assess at this time, the rainbow snake may be more abundant in the Potomac Lowlands than collections indicate. Draining of these areas, road building, dredging for sand and gravel, and other construction activities which would modify and destroy the wetlands here could conceivably cause damage to the species in Maryland. Note that three of the four specimens found to date in Maryland were unearthed during road building operations. Two of these were apparently killed for their beautiful skins, while the third died in a jar after several days of captivity and was destroyed. Two of the three were females (one contained eggs), as was the specimen found dead on U. S. 301 near Newburg.

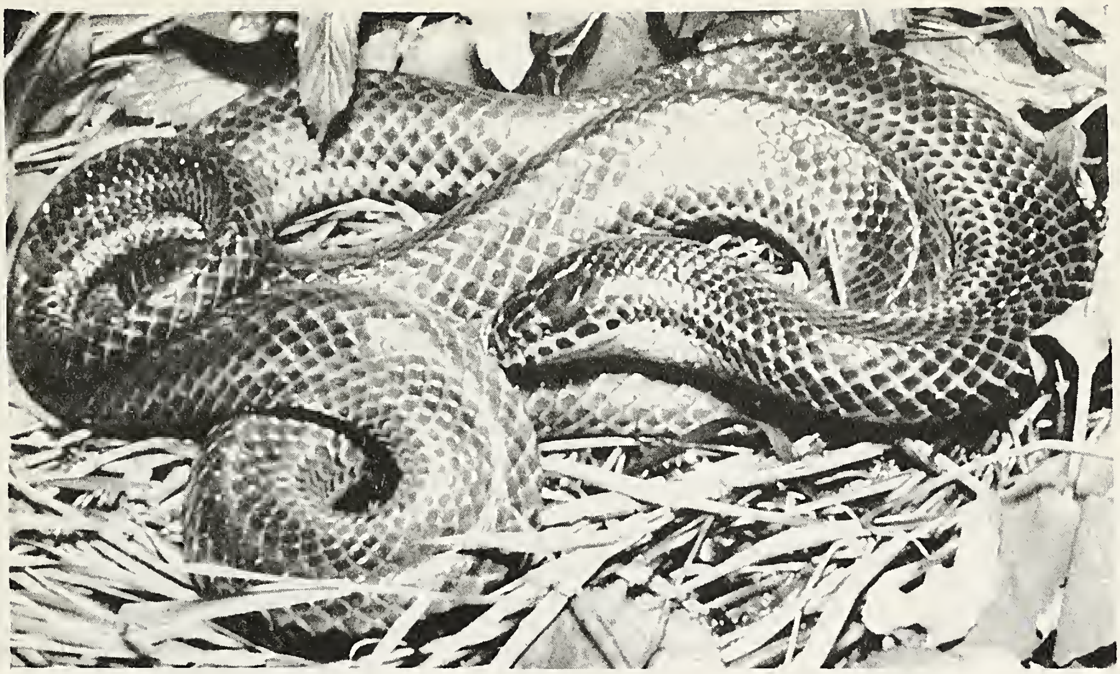
References:

COOPER, John E. 1960. Another Rainbow Snake, *Abastor erythrogrammus*, from Maryland. Chesapeake Science, 1(3-4):203-204.

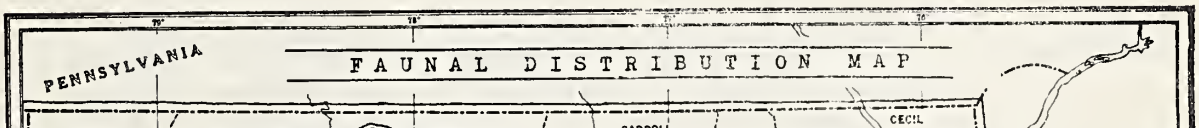
MC CAULEY, Robert H. 1939. An Extension of the Range of *Abastor erythrogrammus*. Copeia (1):54.

__________. 1945. The Reptiles of Maryland and the District of Columbia. Pub. by author, Hagerstown, Md. 194 pp.

RICHMOND, Neil D. 1945. The Habits of the Rainbow Snake in Virginia. Copeia (1):28-30.



Farancia e. erytrogramma



Distribution in Maryland of
Farancia e. erytrogramma

8. *Virginia valeriae pulchra* (Richmond). Mountain Earth Snake.

Distribution: This is an Allegany Plateau snake in Maryland and is recorded only from Swallow Falls Park, Garrett County, and immediate environs. It appears to be very localized in suitable habitats along Maple Glade Road ("Moss Fields"), and a few localities along the Snaggy Mountain and Cranesville Roads.

Abundance: Uncommon; appears to have low population densities.

Habitat Requirements: Specimens have been found under rocks in forested areas with high humidity and dense undergrowth of pteridophytes and bryophytes, and in a bog where pteridophytes, sphagnum and other mosses predominate. Habitat requirements appear to be quite stringent, involving considerable moisture and cover. See discussion of *Eumeces anthracinus.*

Home Range: Nothing known.

Reproductive Potential and Survivorship: Very small number of young produced. On August 25, 1957, four young were born to a female from "Moss Fields" (Cooper, 1958), and six young were born to a female from the same locality on September 10, 1962 (Harris, unpublished). Four litters born to Pennsylvania females numbered five, five, seven, and eight (Richmond, 1954).

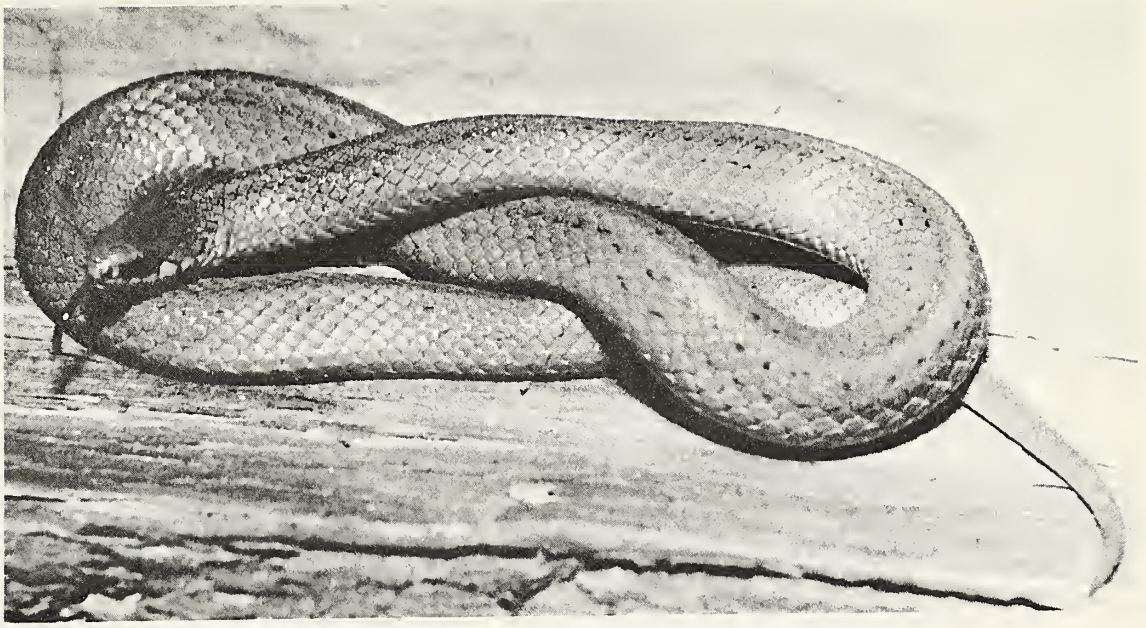
Food Habits: Unknown, but a related lowland subspecies (*V. v. valeriae)* is recorded as eating earthworms, insects, and snails.

Status and Problems: The habitat of *V. v. pulchra* is being altered by timbering activities. The areas adjacent to the "Moss Fields," formerly of mixed deciduous and hemlock, have experienced clearcutting and are being replaced to some extent with a pine monoculture. An attempt is also underway at this locality in an effort to apparently drain off the surface water. The population of *pulchra* here, as well as that of *Eumeces a. anthracinus,* is considered to be in jeopardy and appears to have already been seriously damaged. (See discussion under *Eumeces a. anthracinus.)*

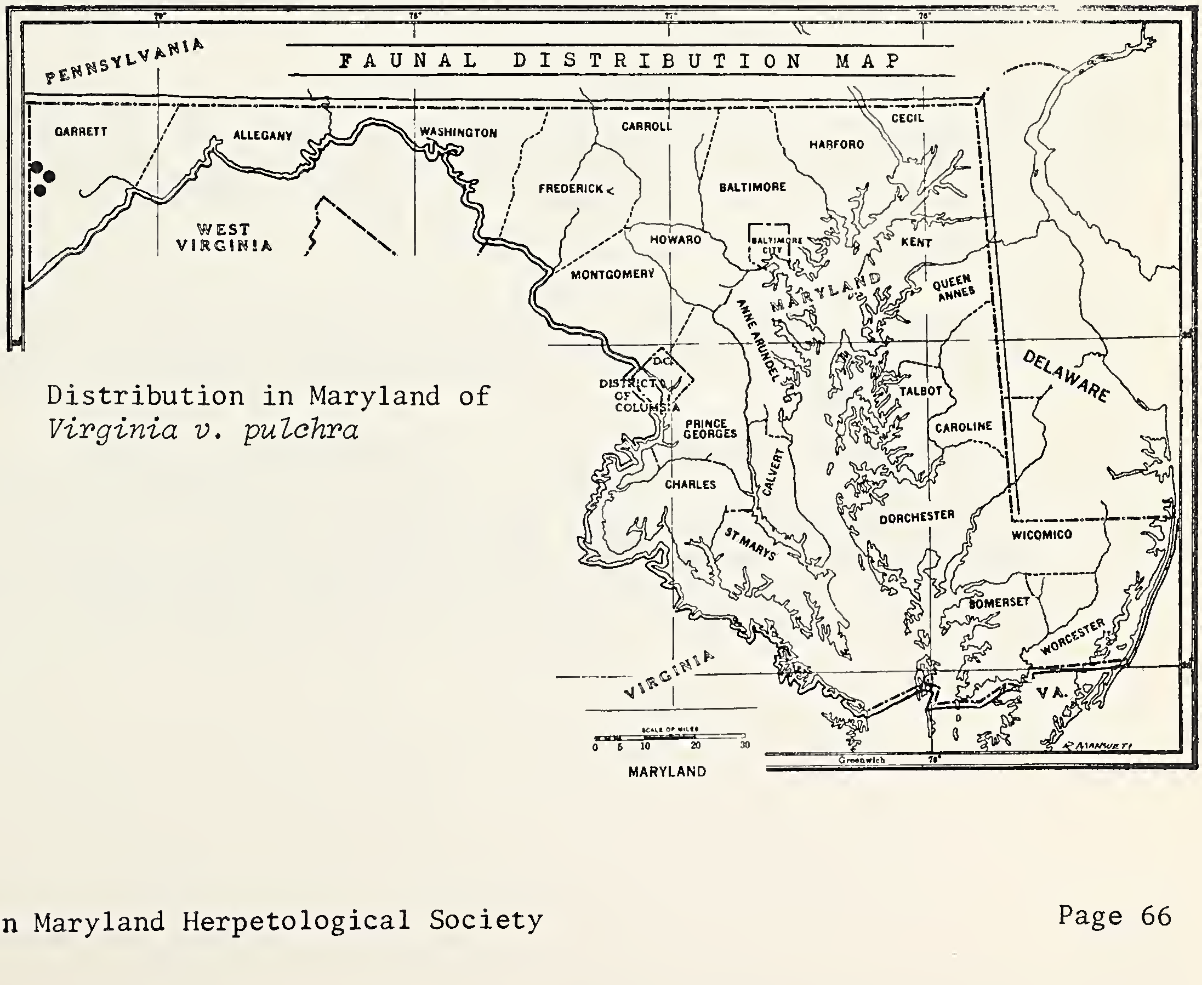
References:

COOPER, John E. 1958. The snake *Haldea valeriae pulchra* in Maryland. Herpetologica, 14:121-122.

RICHMOND, Neil D. 1954. Annals Carnegie Museum, 33:251-260.



Virginia v. pulchra



Distribution in Maryland of
Virginia v. pulchra

9. *Clemmys muhlenbergi* (Schoepff). Bog Turtle.

Distribution: There are at least 30 small and isolated populations of this attractive little turtle known in Maryland. They are in extreme northeastern Carroll County, northern Baltimore and Harford Counties, and Cecil County. A single specimen is known from a marshy area near Laurel, Prince Georges County, but its natural occurrence here is questionable.

Abundance: Although some populations are apparently larger than others, Wemple and Nemuras (unpublished), who have conducted extensive investigations of Maryland *muhlenbergi* populations, maintain that 50 turtles for each colony would be a generous estimate. Nemuras (unpublished) feels that Maryland probably supports in the vicinity of 50 colonies of *muhlenbergi*.

Habitat Requirements: All Maryland localities have several features in common, including permanent water supply, much of which is standing or slowly trickling and about an inch deep; openness; and an abundance of grasses, cattails, and arrowheads. The water is almost always from springs and seeps on the sides or at the bottom of a hill. These habitats are characteristic and readily identifiable to the practiced eye. They are usually small, an acre or so in area, and sites within a given locality may be several miles apart.

Home Range: Barton tracked a single individual with a spool of thread attached and found that its greatest distance of movement, to a hibernation site, was 200 feet. Wemple (unpublished) found several captured and released turtles in almost the identical spot in the succeeding year, and feels that the effective home range is quite small. The same investigator has made preliminary observations which indicate homing on the part of *C. muhlenbergi*, at least for short distances.

Breeding Potential and Survivorship: Clutch size is small, with from three to five eggs being laid in late May or early June. Incubation period is about 60 days and the young grow rapidly following hatching. One investigator feels, based on statistical considerations, that hatchling survival is not very great. The eggs are known to be preyed upon by raccoons.

Food Habits: This turtle appears to be primarily carnivorous, feeding on insects and other invertebrates. Captives can overpower and eat crayfish up to three inches in length, consuming even the exoskeleton, and will completely devour small goldfish.

Status and Problems: The bog turtle is endangered by habitat destruction and by its high value in the pet trade. A colony at Bel Air, Harford County, has been seriously damaged and probably destroyed by construction activities of a golf club. Tropical Storm Agnes apparently destroyed a habitat along the Susquehanna River in Cecil County in 1972, but overcollecting may have already seriously depleted the colony. Habitats may be destroyed directly by bulldozing and draining, and indirectly by sinking wells which drop local water tables and dry up the necessary springs and seeps. Except for a small southern population, much of the national range of this turtle is in areas that are rapidly urbanizing. Transplantation has been considered as a possible means of saving members of populations faced with destruction. However, if the home range is as small as the preliminary evidence indicates, and if the animals exhibit homing, such measures would probably be fruitless. This would be even more true if territoriality plays a significant role in their behavior.

A number of popular magazines emphasize that turtles make excellent pets, and turtle keeping is a growing and thriving hobby. The bog turtle is one of the most sought-after species amongst turtle fanciers. As an indication of the demand for this turtle, and the danger it faces in this area, recent "reptile price lists" list this species at $100 each. In the wild the turtles usually make little attempt to hide or escape when encountered, thus are easily captured. In addition, an efficient trapping method has been devised. As previously stated, an experienced collector has no trouble spotting the habitat of *C. muhlenbergi*.

The bog turtle is presently protected in Pennsylvania and New York. It is considered "endangered" in New Jersey, but the law does not prohibit its collection. New Jersey is aware of this problem and is revising the law. The turtle is on the U. S. Department of the Interior's "Threatened Wildlife of the United States List," but is not considered nationally endangered at this time. The fact that it is protected in New York and Pennsylvania leaves Maryland colonies conspicuously exposed, which is one reason why herpetologists are extremely reluctant to release information on the locations of populations. The only colony that was even partially protected in Maryland (part of it was in a wildlife refuge) may have been badly damaged by torrential flooding.

References:

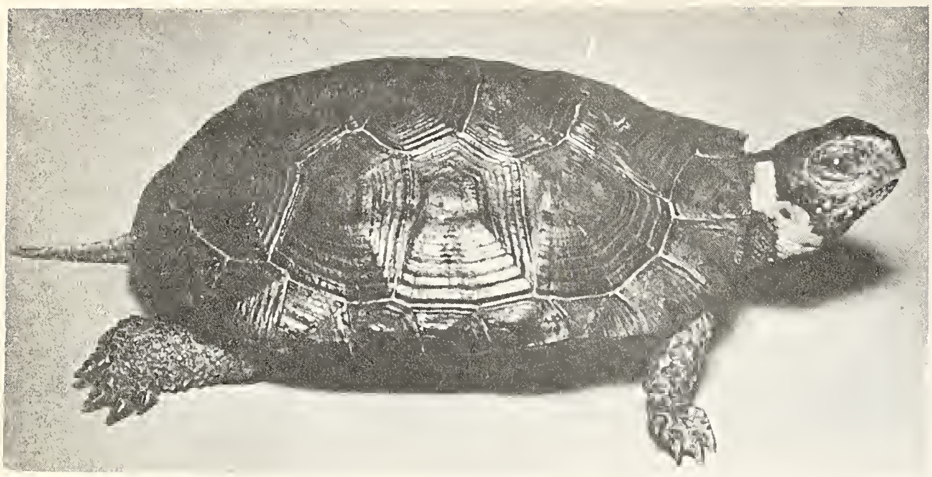
BARTON, A. J. and J. W. Price, Sr. 1955. Our knowledge of the bog turtle, surveyed and augmented. Copeia (3):159-165.

CAMPBELL, Howard W. 1960. The bog turtle in Maryland. Md. Natur., XXX(1-4): 15-16.

COOPER, John E. 1949. Additional records for *Clemmys muhlenbergii* from Maryland. Herpetologica, 5(3):75-76.

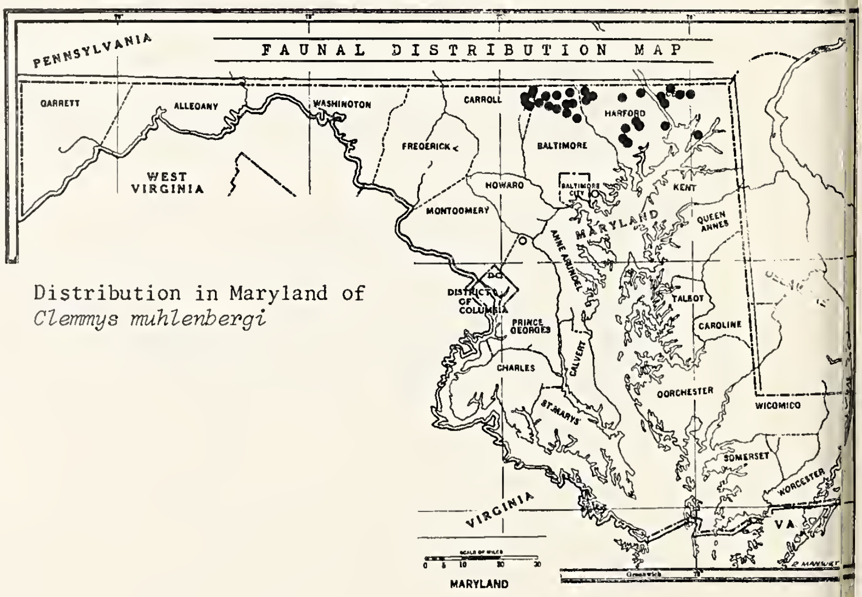
MC CAULEY, Robert H. and R. Mansueti. 1943. *Clemmys muhlenbergii* in Maryland. Copeia (3):197.

NEMURAS, Kenneth T. 1967. Notes on the natural history of *Clemmys muhlenbergi*. Bull. Md. Herp. Soc., 3(4):80-96.



Clemmys muhlenbergi

A typical habitat of *C. muhlenbergi* in Carroll County, Maryland



Distribution in Maryland of *Clemmys muhlenbergi*

10. *Chelonia mydas mydas* (Linnaeus). Atlantic Green Turtle.

Distribution: Calvert County (Chesapeake Bay) and Worcester County (Atlantic seaside). Summer occurrence.

Abundance: Unknown, but probably more abundant in this area than present records indicate.

Habitat Requirements: Marine. Optimum habitat is shoal water two to four fathoms deep over extensive plant beds, but it also occurs in open ocean, notably when undertaking migrations. Eggs are deposited on oceanic beaches.

Home Range: The species is capable of extensive migrations, as, for example, from Ascension Island to the coast of South America. Female green turtles frequently home to within 200 yards of their previous nest site after a 2-year absence. In the latitudes of Maryland it occurs in the summer months only.

Reproductive Potential and Survivorship: Nesting occurs every second or third year. Each female deposits five to seven clutches at intervals of about two weeks, and each clutch contains about 75 to 200 eggs (average 106). The incubation period is 52 to 60 days. Mortality is very high, and only 1 of 500 hatchlings reaches maturity. Egg deposition occurs from April to August, but nesting has not been recorded in the latitudes of Maryland.

Food Habits: Primarily herbivorous, but also occasionally feeds on jellyfish, mollusks, crustaceans, and fish.

Status and Problems: The green turtle is heavily exploited for meat, oil, shell, and eggs. International conservation efforts have been largely futile. Costa Rica and Nicaragua control the world's most important nesting beaches and feeding areas, and both have recently opened large turtle processing factories, without regard to the plight of this species. Even in the United States, "medieval legislation, staunchly supported in recent political controversy, permits the commercial exploitation of an almost vanished green turtle colony" (Carr, 1972; the colony in question is in Florida.). Carr, a leading authority on sea turtles, regards all eight known species as endangered. *Chelonia mydas* ranks sixth in a scale of decreasing security. The I. U. C. N. Red Data Book regards the species as depleted, and defines this as "although still occurring in numbers adequate for survival, the species has been heavily depleted and continues to decline at a rate which gives cause for serious concern." The Committee on Rare and Endangered Wildlife Species of the U. S. Department of the Interior previously regarded the green turtle as "peripheral" in spite of the existence of nesting colonies within the United States, and defined a peripheral species as one "whose occurrence in the United States is at the edge of its natural range and which is rare or endangered within the United States although not in its range as a whole." They add that "special attention is necessary to assure retention in our nation's fauna." In the 1973 edition, the United States Department of the Interior lists *Chelonia mydas* in the category of "Threatened Wildlife of the United States". Disturbing of nesting adults or eggs is prohibited in South Carolina, Georgia, Florida (although apparently with exceptions) and Texas, but efforts to prevent this are not yet very effective. There are apparently no laws prohibiting the sale of turtle goods in the United States. Efforts are now being made to establish new colonies of green turtles through the release of hatchlings.

References:

CARR, Archie F. 1952. Handbook of Turtles. Comstock Publishing Company, Ithaca, N. Y. 542 pp.

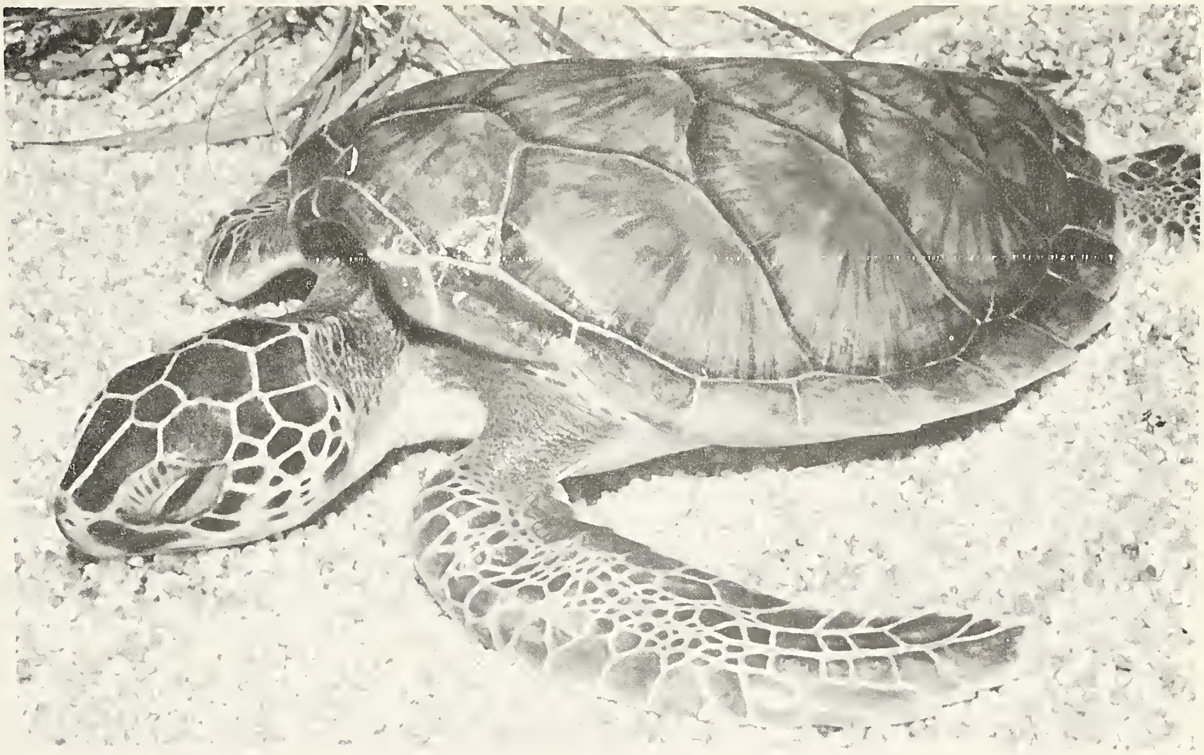
__________. 1967. So Excellent a Fische. A Natural History of Sea Turtles. Natural History Press, Garden City, N. Y. 248 pp.

__________. 1972. Great reptiles, great enigmas. Audubon, 74(2):24-35.

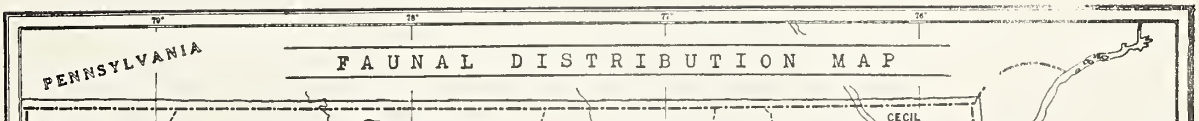
COMMITTEE ON RARE AND ENDANGERED WILDLIFE SPECIES. 1966. Rare and endangered fish and wildlife of the United States. Bureau of Sport Fisheries and Wildlife, U. S. Dept. Interior, Resources Pub. 34.

HANEGGER, Rene E. 1968. Red Data Book. Vol. 3, Amphibia and Reptilia. Int. Union for Conservation of Nature and Natural Resources. Survival Service Commission.

HARRIS, Herbert S., Jr. 1969. Distributional Survey: Maryland and the District of Columbia. Bull. Md. Herp. Soc., 5(4):97-161.



Chelonia m. mydas



Distribution in Maryland of
Chelonia m. mydas

11. *Eretmochelys imbricata imbricata* (Linnaeus). Atlantic Hawksbill.

Distribution: There are no known specimens from Maryland although a number of authors have pointed out that it probably occurs in our area (Hardy, 1972; Schwartz, 1967). Klimkiewicz (1972) has further stated that it possibly occurs in "the Potomac River estuaries." Since the species has been reported in coastal waters as far north as Massachusetts, individuals must certainly pass, at least occasionally, through Maryland waters.

Abundance: No information available for Maryland. The species is decreasing at an alarming rate throughout its range.

Habitat Requirements: Shallow, coastal marine waters. Sometimes associated with dense vegetation, but also in bays and lagoons with muddy bottoms. Eggs are deposited on oceanic beaches.

Home Range: No specific information available, but this is another long-distance migrant, although its movements may not be as extensive as those of other Atlantic species.

Reproductive Potential and Survivorship: Average fecundity is 150 eggs. One female may produce three clutches each breeding season. The nesting season extends from April to August in American waters and up to October in Danish waters. Nesting occurs, or at one time occurred, on Florida beaches. The hawksbill is much more solitary than other sea turtles, and nest sites are widely scattered.

Food Habits: Omnivorous, eating algae, ascidians, mollusks, crustaceans, jellyfish, and fish.

Status and Problems: Eggs are preyed upon by humans. Adults are used for making tortoiseshell, calipee, "green turtle" soup, and leather. Shells and stuffed specimens are frequently sold in souvenir shops (including in Maryland resort areas), and mounted specimens are used extensively to decorate bars and restaurants. Young specimens are collected for "sport" by scuba divers more frequently than other species. The hawksbill is ranked as seventh or eighth of eight in the scale of decreasing security. The Red Data Book lists it as clearly endangered, which means that it is in immediate danger of extinction. Because of the widely scattered nesting sites, protection will be extremely difficult. Locally, restriction of the sale of hawksbill turtle goods would be a step in the right direction in attempting to save this critically endangered species.

References:

CARR, Archie F. 1952, 1967, and 1972. See references under *Chelonia mydas mydas*.

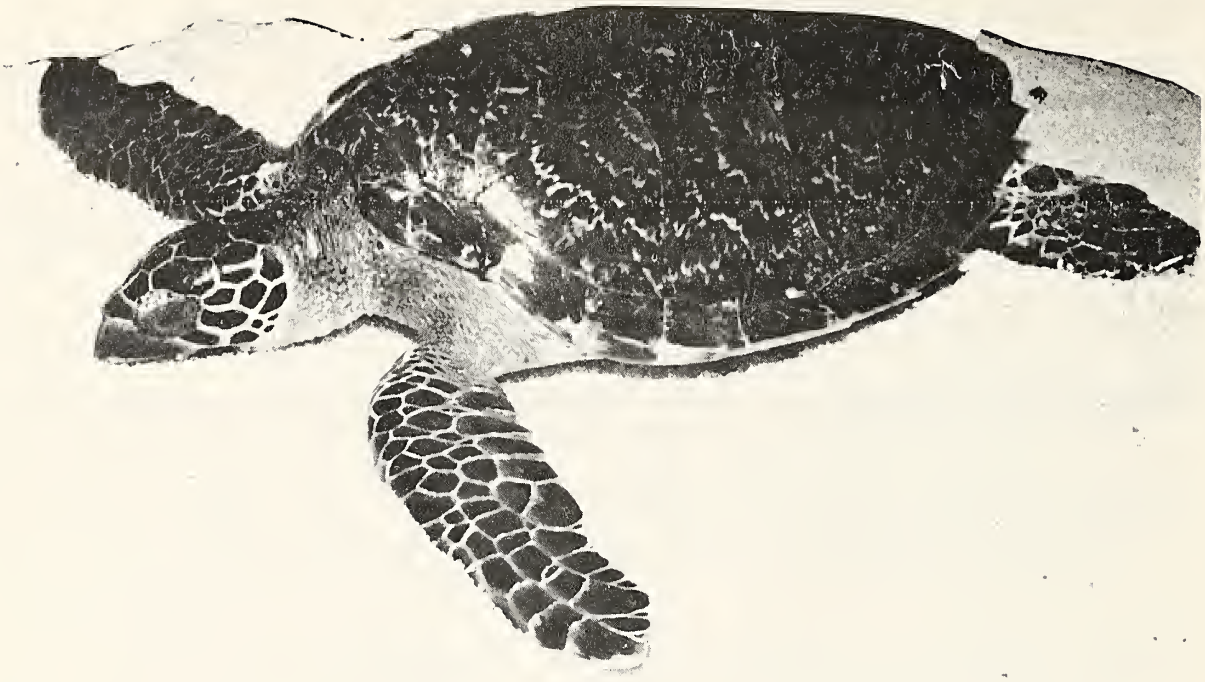
HANEGGER, Rene E. 1968. See reference under *Chelonia m. mydas*.

HARDY, Jerry D. 1972. Reptiles of the Chesapeake Bay region. In Biota of the Chesapeake Bay. Chesapeake Science 13(supplement):S128-S134.

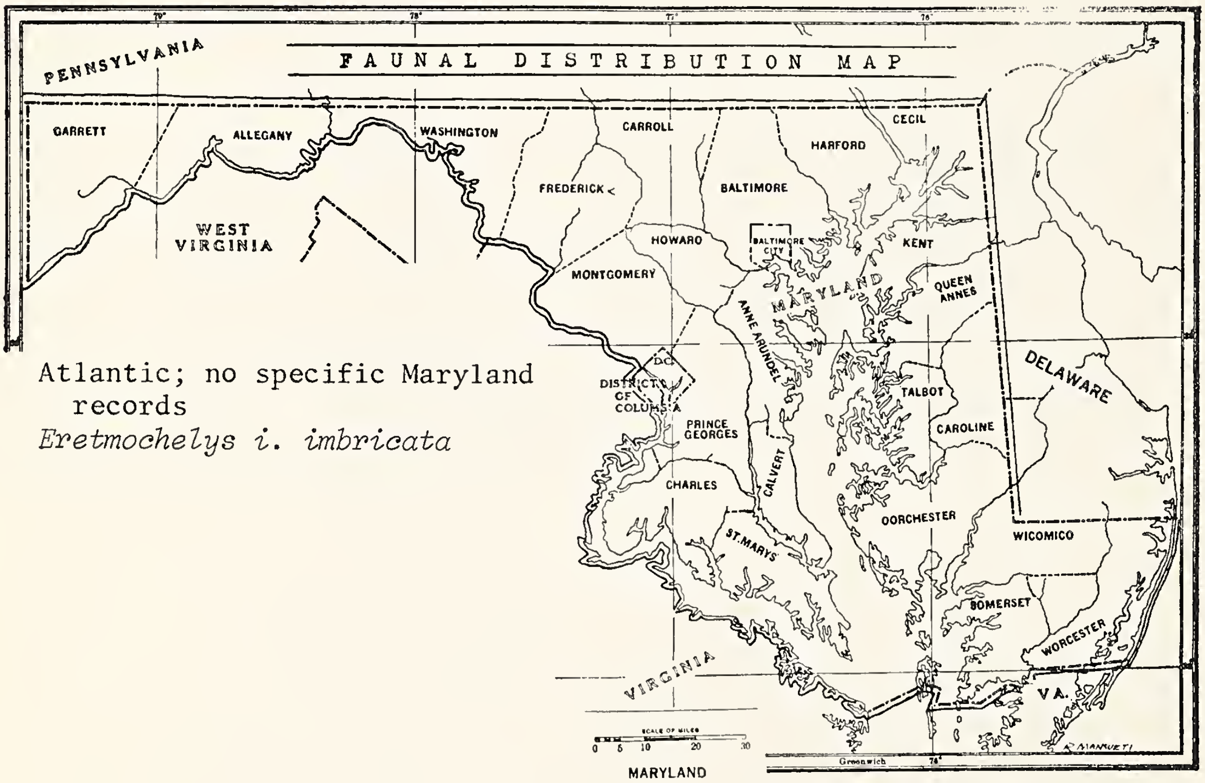
HARRIS, Herbert S., Jr. 1969. See reference under *Chelonia m. mydas*.

KLIMKIEWICZ, M. Kathleen. 1972. Reptiles of Mason Neck. Atlantic Naturalist, 27(1):20-25.

SCHWARTZ, Frank J. 1969. Maryland Turtles. Univ. Md., Nat. Res. Inst., Educ. Series (79), 38 pp.



Eretmochelys i. imbricata



Atlantic; no specific Maryland records
Eretmochelys i. imbricata

12. *Caretta caretta caretta* (Linnaeus). Atlantic Loggerhead.

Distribution: Worcester and Wicomico Counties along the Maryland seaside, and in the Chesapeake Bay off Dorchester and Calvert Counties.

Abundance: The species is probably more abundant in marine waters of Maryland than the few existing records indicate. The total Atlantic population is declining at an alarming rate.

Habitat Requirements: Primarily marine, but also recorded from shallow coastal bays, and known to ascend to the heads of small creeks in tidal marshes. Eggs deposited on oceanic beaches.

Home Range: No specific information available. The species is a migrant, and of distinctly seasonal (summer) occurrence in the latitudes of Maryland.

Reproductive Potential and Survivorship: Nesting occurs at two or three year intervals. Fecundity from 64 to 198 eggs, average 126. Incubation period is from 31 to 65 days, average 55. Nesting occurs from April to August, and nest sites are now known as far north on the Atlantic coast as Ocean City, Maryland.

Food Habits: Mainly carnivorous, occasionally herbivorous. Eats conchs, crabs, fish, clams, shrimp, sponges, jellyfish, and turtle grass.

Status and Problems: Loggerhead nest sites are seriously affected by the simple presence of seaside developments. Lights from coastal highways attract hatchlings, causing them to move away from the sea, and young are frequently killed by highway vehicles. Eggs are frequently eaten by raccoons and humans. Offshore, adults are accidentally killed in fish nets, and the number of such drownings is on the increase. Carr ranks *Caretta* third of eight in his scale of decreasing security. The Red Data Book regards the species as depleted, declining at a rate which gives cause for serious concern. Loggerhead rookeries are now protected at Everglades National Park, along most of the Florida coast, and in Georgia, South Carolina, and North Carolina. The sale of turtle goods is still apparently permitted in all of these states, although South Carolina enacted a bill in July, 1972, which prohibits the sale of products made from any endangered species.

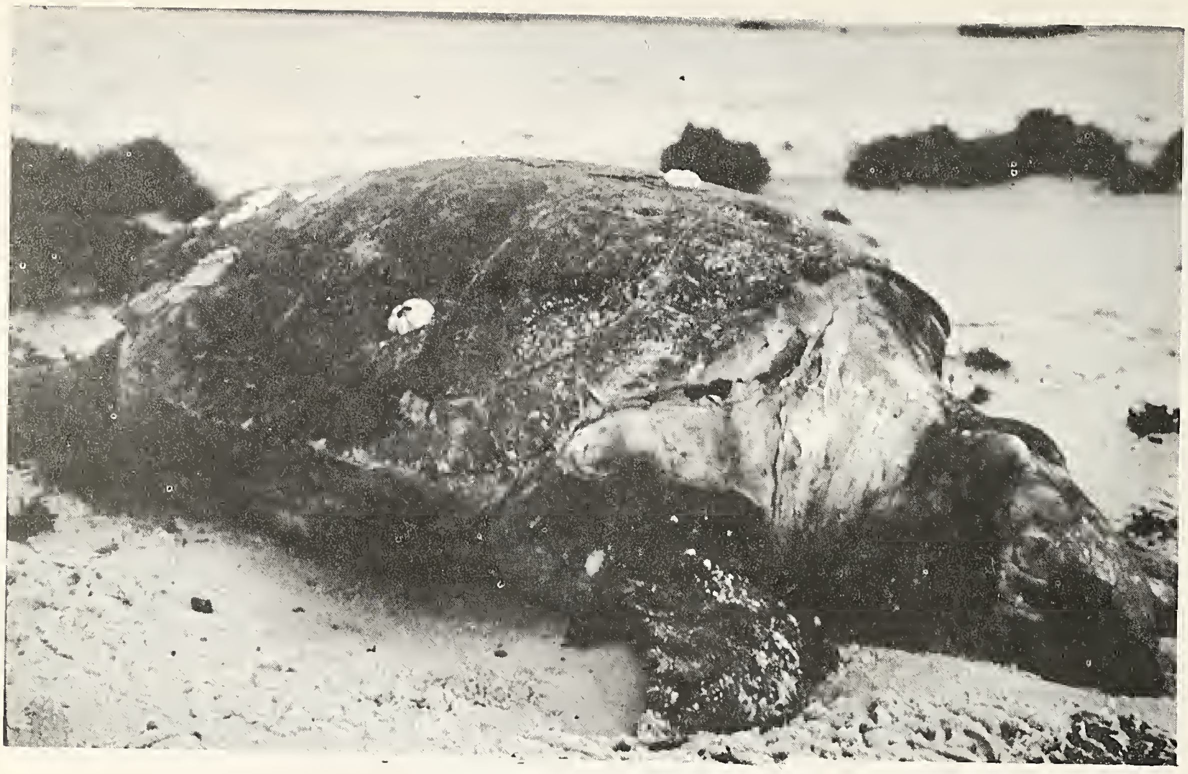
References:

BALTIMORE EVENING SUN. July 25, 1972. Sea turtles, flamingo, seal. Exotic visitors stray to Maryland shore.

CARR, Archie F. 1952 and 1972. See references under *Chelonia m. mydas*.

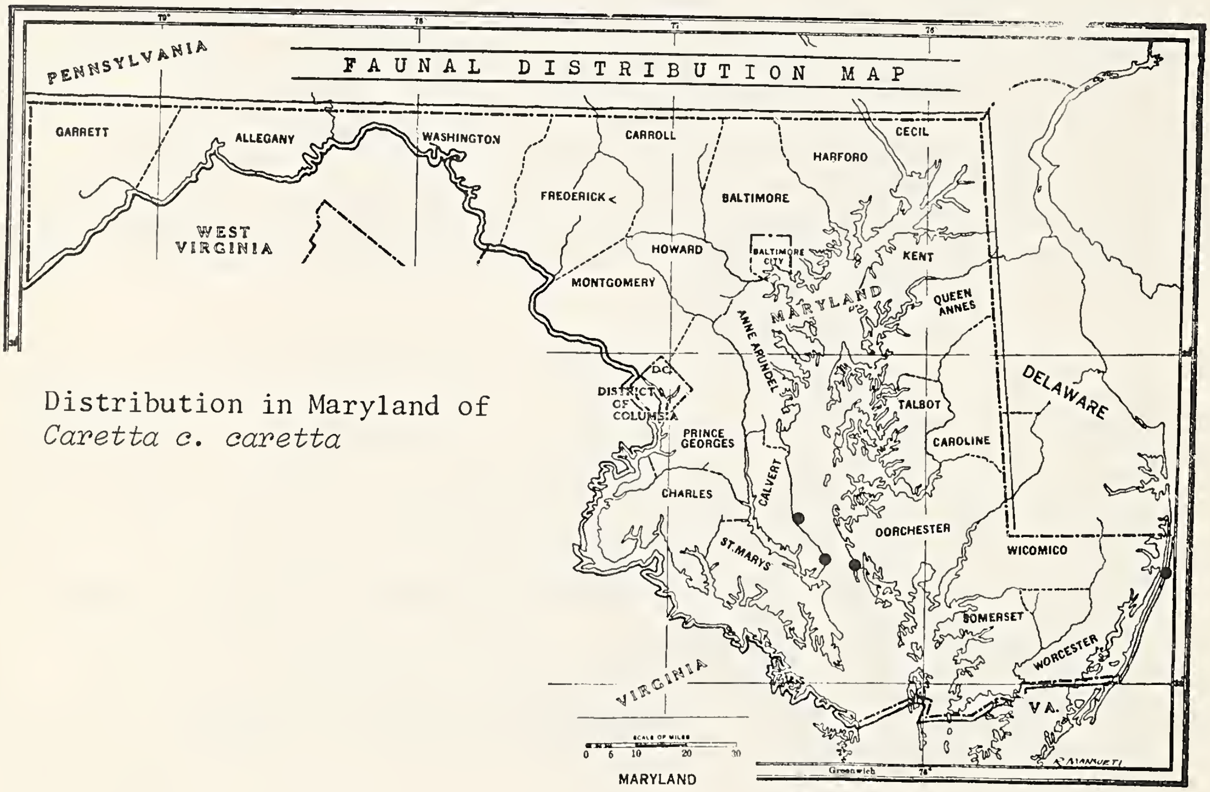
HANEGGER, Rene E. 1968. See reference under *C. m. mydas*.

HARRIS, Herbert S., Jr. 1969. See reference under *C. m. mydas*.



Caretta c. caretta

Specimen washed up on Assateaque Island, Maryland.



Distribution in Maryland of
Caretta c. caretta

13. *Lepidochelys kempi* (Garman). Atlantic Ridley.

Distribution: Four Maryland specimens are known -- one from Baltimore Harbor, two from Calvert County, and one from the mouth of the Potomac River (Hardy, 1962).

Abundance: Probably at one time more abundant in the latitudes of Maryland than present records would indicate, but now becoming exceedingly rare throughout its range and consequently probably also rare in the Maryland area.

Habitat Requirements: Coastal marine waters. Eggs are deposited on oceanic beaches.

Home Range: With the exception of occasional isolated individuals, nesting occurs in only one area in Mexico, an area to which the females apparently home from long distances. It is known only during the summer months in the Maryland latitudes.

Reproductive Potential and Survivorship: Nesting apparently occurs annually, March through June. Females lay approximately 100 eggs, and the incubation time is around 58 days. The principal nesting area is the coast of Tamaulipas, Mexico, although a number of nest sites have been observed elsewhere, as, for example, at Padre Island, Texas. Michael Castagna, Virginia Institute of Marine Science (personal communication to J. Hardy) reported that a ridley deposited eggs on the Atlantic side of Virginia's Eastern Shore. He also reports the nesting of *Caretta caretta* in the same area.

Food Habits: Various species of crabs, including the blue crab, *Callinectes sapidus*.

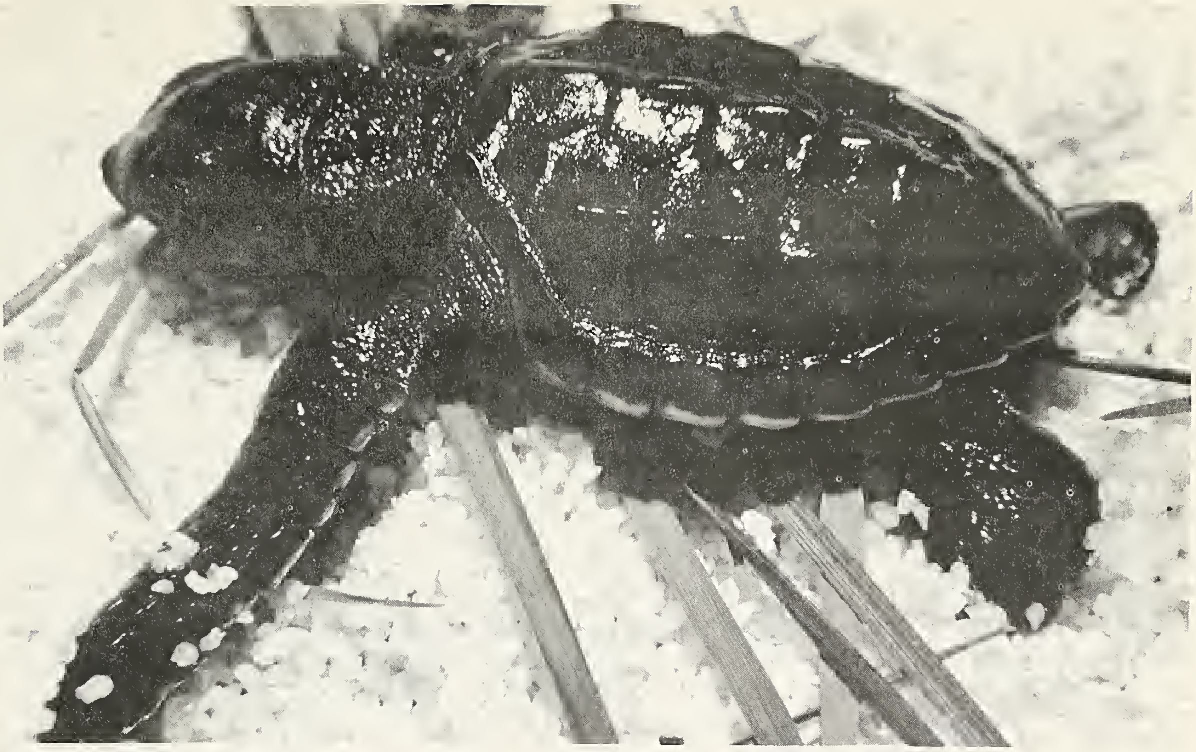
Status and Problems: The major threat to the ridley is hide hunting, but the eggs are also preyed upon by humans. Hide hunters in Mexico "have repeatedly tried to get permits from the Mexican government to raid the colony" (Carr, 1972; the colony at Tamaulipas). Carr (1967) stated that *Lepidochelys kempi* had "the most precarious survival outlook of any sea turtle." Later (1972) he ranked the ridley seventh or eighth of eight in his scale of decreasing security. The Red Data Book considers it endangered, "in immediate danger of extinction (so that) continued survival unlikely without the implementation of special protective measures." Although the Mexican nesting sites are apparently now protected by the government, the sale of turtle goods (including leather) is still permitted in the United States. As long as there is a market for these goods, the ridley will be in danger.

References:

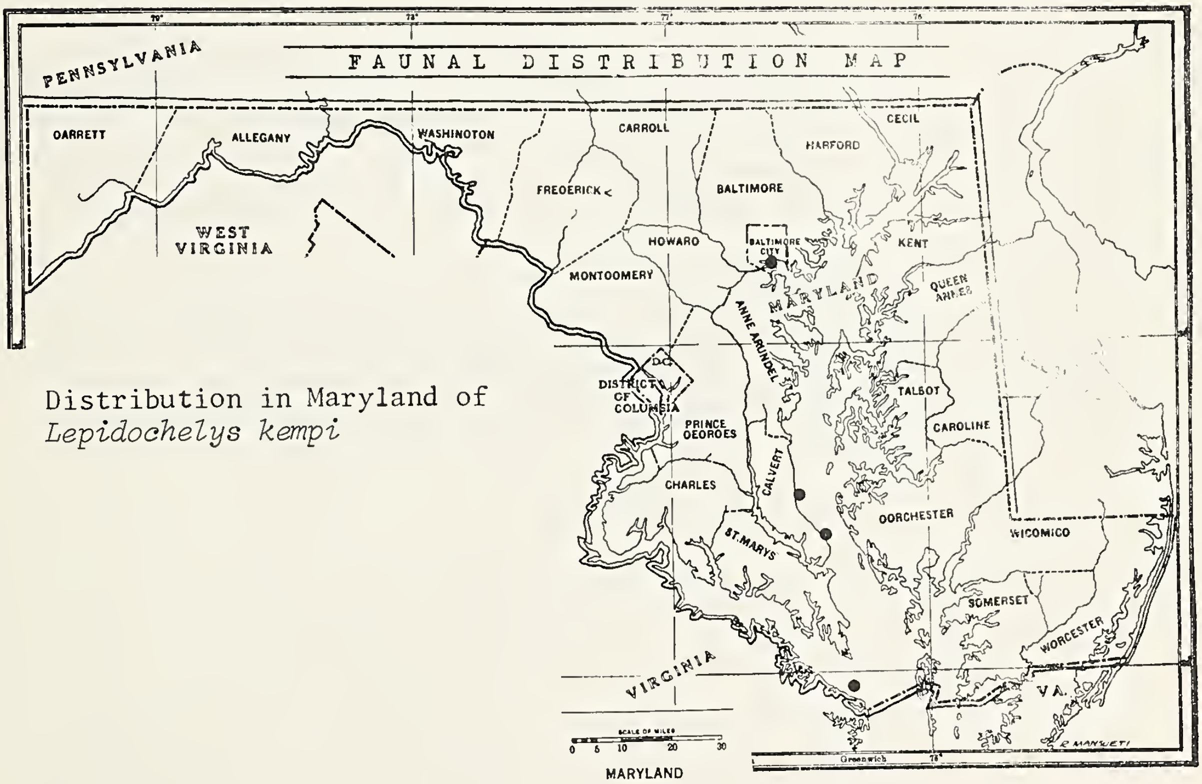
CARR, Archie F. 1952, 1967 and 1972. See references under *Chelonia m. mydas*.

HANEGGER, Rene E. 1968. See reference under *C. m. mydas*.

HARDY, Jerry D. Jr. 1962. Comments on the Atlantic ridley turtle, *Lepidochelys olivacea kempi*, in the Chesapeake Bay. Chesapeake Sci., 3(3):217-220.



Lepidochelys kempi



Distribution in Maryland of
Lepidochelys kempi

14. *Dermochelys coriacea coriacea* (Linnaeus). Atlantic Leatherback.

Distribution: Four specimens are known from the shores of the Chesapeake Bay, three are from Calvert County and one from Dorchester County.

Abundance: Unknown. There is a general decrease in the world population of this mammoth reptile.

Habitat Requirements: A pelagic marine species which is usually restricted to warm seas but which occasionally comes in to shallow coastal waters. Eggs are deposited on oceanic beaches.

Home Range: This is a wide-roaming species, but it is not known if its movements represent definite migrations. It occurs in the latitudes of Maryland only during the summer months.

Reproductive Potential and Survivorship: Eggs are deposited every second or third year, with about eight or nine clutches deposited each season. Clutches vary in size, from 70 to 115. Survival rate is believed to be 1 or 2 hatchlings, out of every 1000, which reach maturity. Nesting occurs in spring and summer, and also possibly in December and January. There are four major nesting sites, all in the tropics. Nesting is of only rare occurrence in Florida, and occurs nowhere near the latitudes of Maryland.

Food Habits: Both plant and animal remains have been found in the digestive tract, but the leatherback is apparently highly specialized for feeding on jellyfish. See Leary (1957), and Bleakney (1967).

Status and Problems: Eggs are sought as a source of food and as a supposed aphrodisiac. Adults are killed and used for fish bait. They are also sometimes lassoed or speared for "sport" and left to die. In the waters of the Chesapeake Bay the species has been captured alive and put on display, due to its unusual appearance and great size. Such individuals inevitably die in captivity. At least two such deaths have been documented in Maryland (Md. Conservationist, 1932; Hardy, 1969).

Carr considers the leatherback to have "the least dreary outlook" of the eight marine turtles. The Red Data Book, on the other hand, considers it to be "clearly endangered," which means in immediate danger of extinction. At least some of the world's nesting sites are protected, but enforcement of protective laws is not wholly effective. Something should be done for those individuals which get into Maryland waters.

References:

BLEAKNEY, J. S. 1967. Marine turtles as introductory material to basic biology. Turtox News, 45(3):82-86.

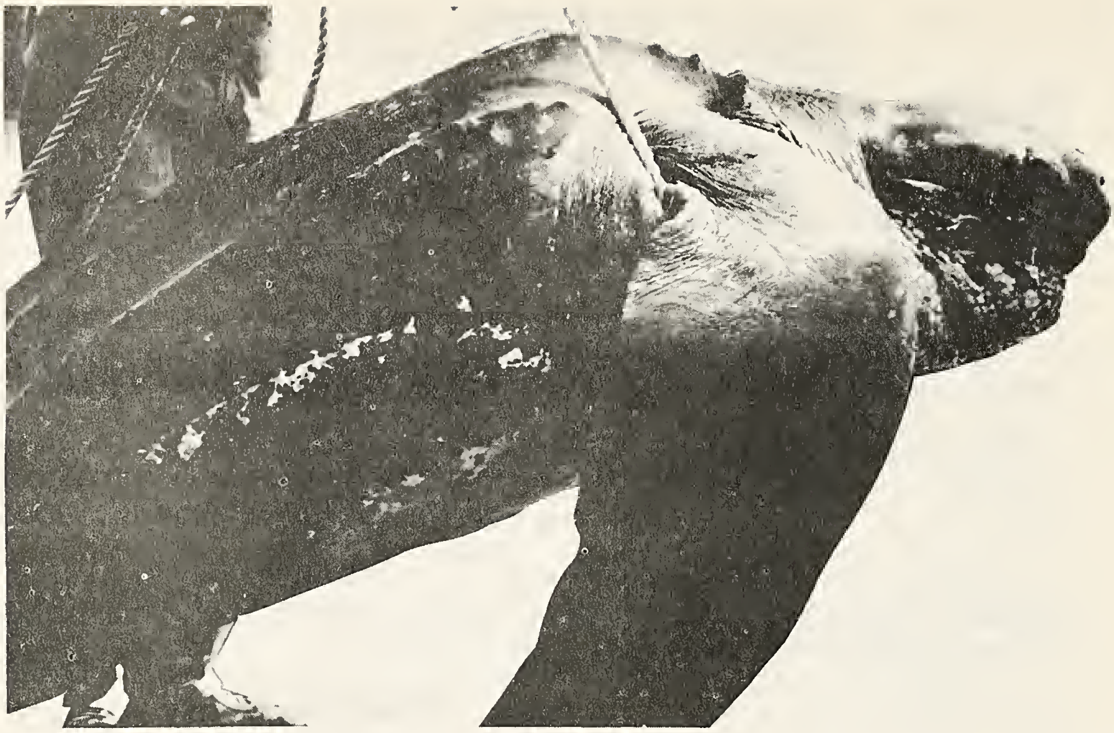
CARR, Archie F. 1952, 1967 and 1972. See references under *Chelonia m. mydas*.

HANEGGER, Rene E. 1968. See reference under *C. m. mydas*.

HARDY, Jerry D., Jr. 1969. Records of the leatherback turtle, *Dermochelys coriacea coriacea* (Linnaeus), from the Chesapeake Bay. Bull. Md. Herp. Soc., 5(3):92-96.

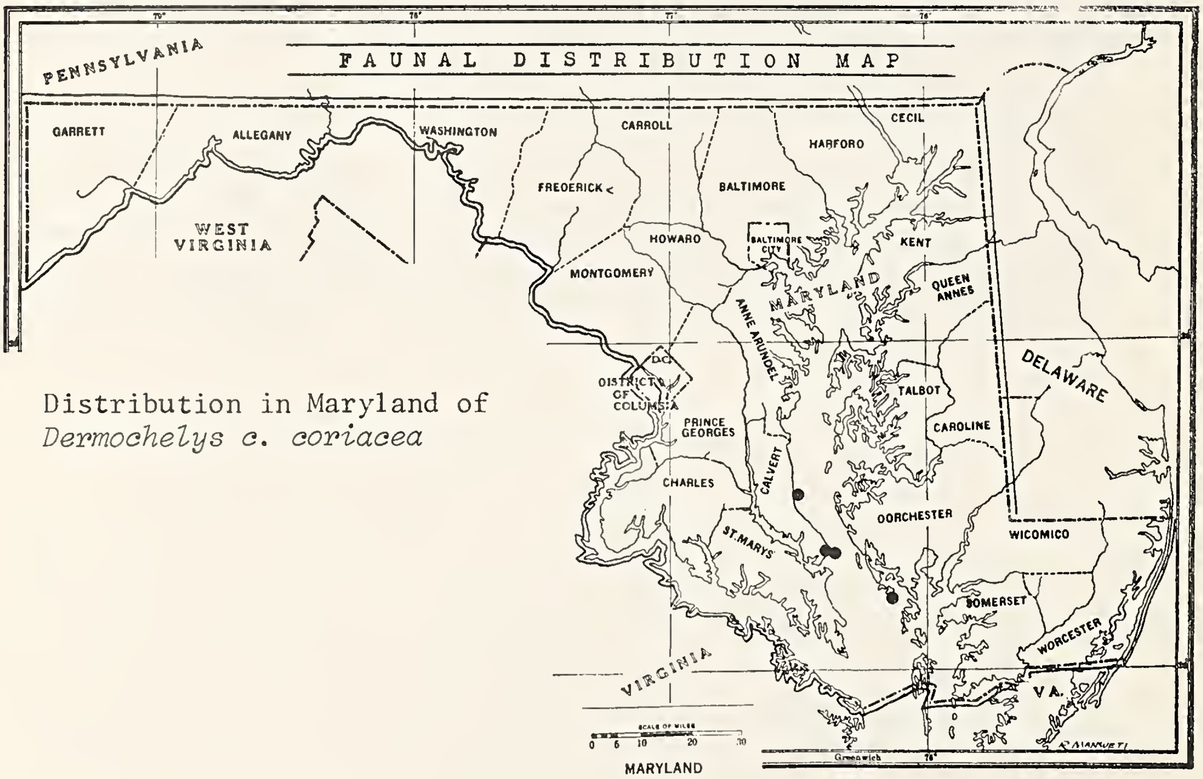
LEARY, T. R. 1957. A schooling of leatherback turtles, *Dermochelys coriacea coriacea,* on the Texas coast. Copeia (3):232.

MARYLAND CONSERVATIONIST. 1932. A monster of tropical seas captured in Maryland waters. Md. Cons., 9(3):21-22.



Dermochelys c. coriacea

Specimen captured in Hooper Strait, Dorchester County, Maryland.



Distribution in Maryland of *Dermochelys c. coriacea*

COMMENTS ON OTHER SPECIES

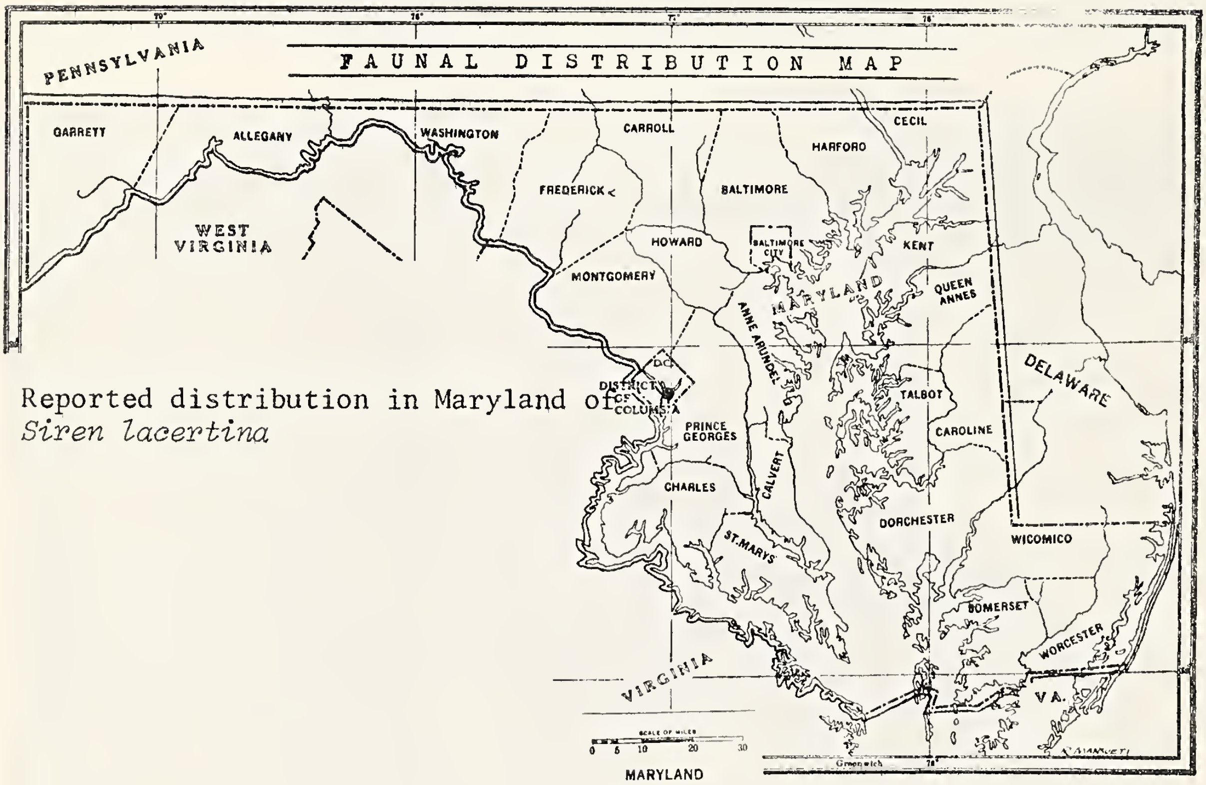
1. *Siren lacertina* (Linnaeus). Greater Siren.

This large amphibian was included in the Maryland herpetofaunal list on the basis of a single specimen reported from "Potomac Flats," District of Columbia, by Hay in 1902. The "Potomac Flats" locale is now part of the highly developed waterfront of Washington, D. C. If there ever was a viable population of *Siren* in the area it has more-than-likely been extirpated by habitat destruction. No additional specimens have ever turned up, and most local workers feel that *Siren* should be removed from the state faunal catalogue. Future collecting could conceivably establish its presence in the Potomac lowlands, but we see no point in having it placed on an endangered species list at this time.

References:

HAY, W. P. 1902. A list of the Batrachians and Reptiles of the District of Columbia and Vicinity. Proc. Biol. Soc. Wash., 15:121-146.

Siren lacertina



Reported distribution in Maryland of *Siren lacertina*

2. *Rana virgatipes* (Cope). Carpenter Frog.

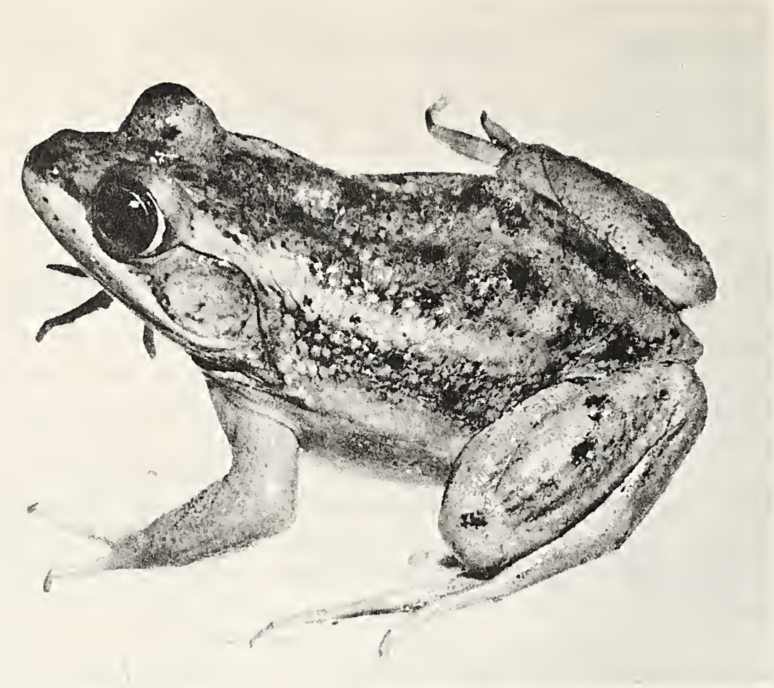
This Coastal Plain frog is found in localized populations from central New Jersey to southern Georgia. In Maryland it's primary range is in the acidic sphagnaceous bogs and white cedar swamps along the upper Pocomoke River and tributaries in Wicomico and Worcester Counties. One record is known for Dorchester County. Its habitat in the upper Pocomoke is truly unique, and a number of other species of animals, and plants, occur there which are very rare and unusual in Maryland. These include Swainson's and worm-eating warblers, crossvine, cypress, *Trillium pusillum*, and red-bellied water snakes (see comments below). Most of these are not found anywhere else in the state. Although the carpenter frog may not now be in danger of extinction in Maryland, the continued removal of white cedar and draining of the suitable habitat in the upper Pocomoke could quickly change the situation. Such activities have already done much to reduce this part of the range of this frog. Adequate safeguards must be taken to prevent changes in the upper and middle Pocomoke, lands which may appear to the uninitiate to be idle and unproductive unless being drained and logged. If not, *Rana virgatipes*, and doubtless the other unique animals and plants of the area, will assuredly be endangered species in Maryland. Conant (1945) suggested that the major population of *R. virgatipes* in Sussex County, Delaware, may have been destroyed by "extensive drainage operations". We have no population data on this frog at all and, after contemplated field work has been completed, may have to request its consideration as an endangered species.

References:

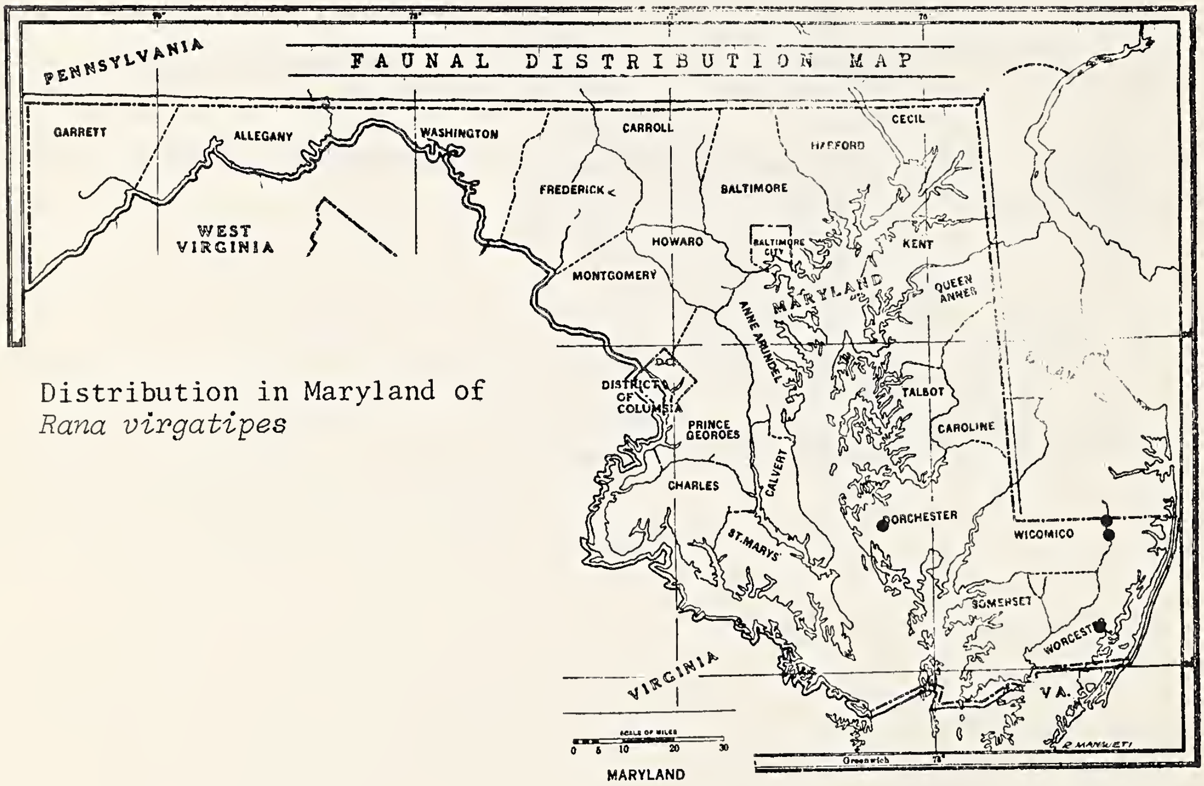
CONANT, Roger. 1945. An annotated check list of the amphibians and reptiles of the Del-Mar-Va peninsula. Soc. Nat. Hist. Del., 8 pp..

__________. 1947. The carpenter frog in Maryland. Maryland, A Journal of Natural History, XVII(4):72-73.

MEANLEY, Brooke. 1951. The carpenter frog, *Rana virgatipes*, on the Coastal Plain of Maryland. Proc. Biol. Soc. Wash:59.



Rana virgatipes



Distribution in Maryland of
Rana virgatipes

3. *Cemophora coccinea copei* (Jan). Eastern Scarlet Snake.

The first known specimen of this rare snake was taken by Professor A. Wyatt in 1862 (Fowler, 1945). In the 110 years between then and now, only eight additional specimens have been recorded (see Cooper, 1950 and 1966, for most recent summary)--one from the District of Columbia (vic. Anacostia), three from Anne Arundel County (St. Margarets, nr. Priest Bridge, and nr. Arnold), two from Prince Georges County (Brandywine and Lanham), one from Calvert County (Cove Point), and one from Wicomico County (nr. Salisbury). On the basis of these records it would appear to be a certainty, as McCauley first suggested (1945), that *Cemophora* is widespread throughout the Maryland Coastal Plain. Thus, despite its rarity, it cannot currently be considered to be endangered. Nonetheless, the perpetual development of Maryland's Coastal Plain, especially in the vicinity of the known *Cemophora* localities on the Western Shore, is assuredly destroying *Cemophora* habitat. How this may be affecting the species cannot be precisely assessed at this time, but it can hardly be helping populations.

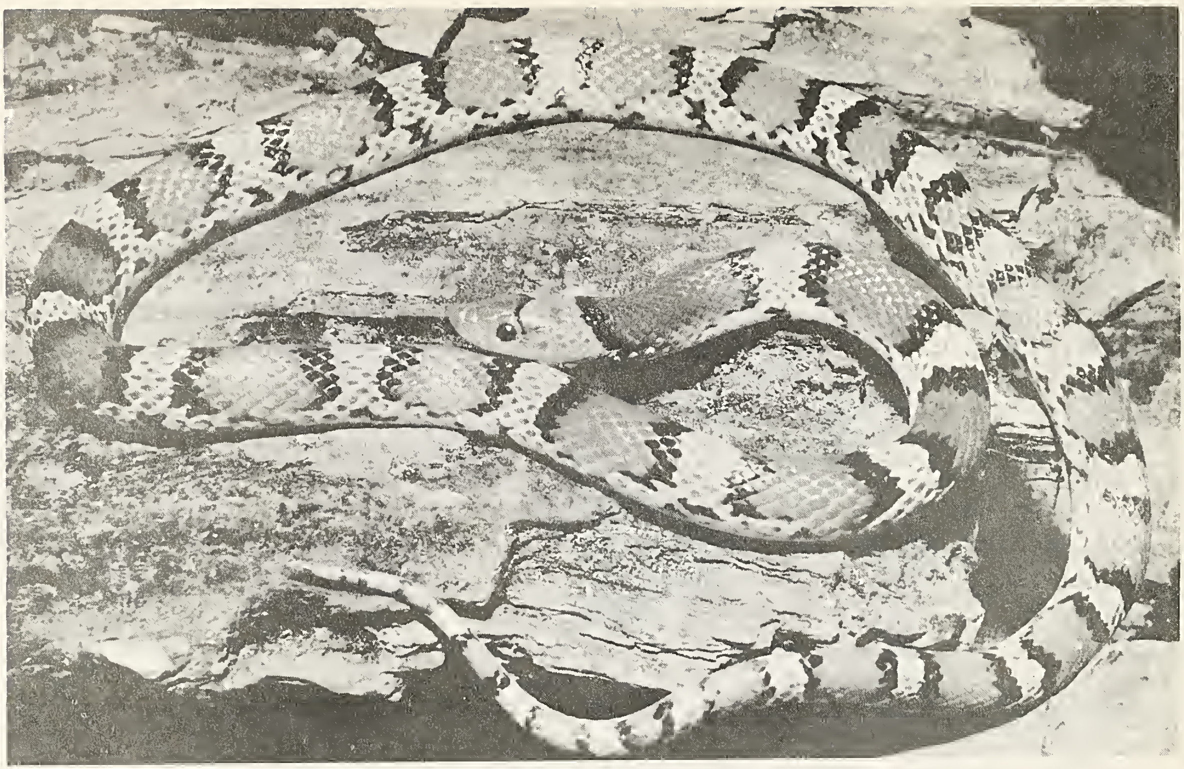
References:

COOPER, John E. 1950. The Scarlet Snake *(Cemophora coccinea)* in Maryland. Md. Natural., XX(4):67-69. Reprinted in Bull. Md. Herp. Soc., 1966, 2(2):10-13.

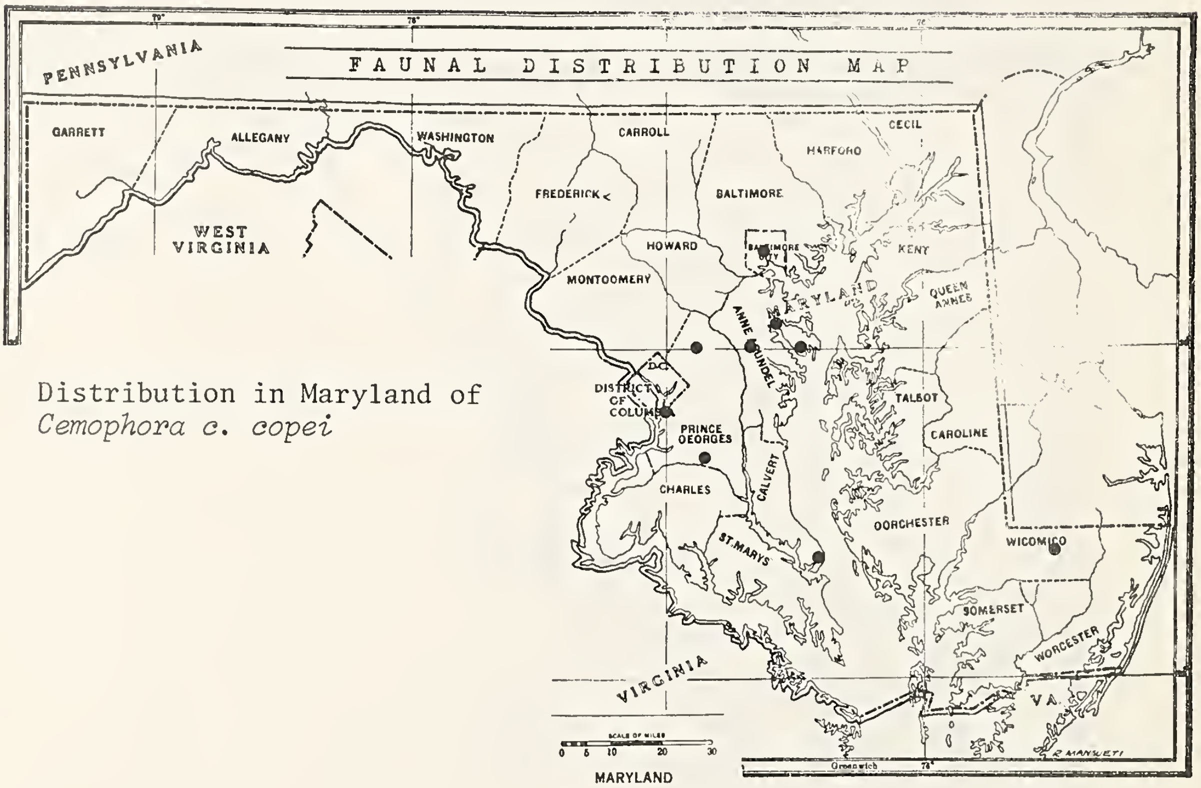
FOWLER, James A. 1945. Notes on *Cemophora coccinea* (Blumenbach) in Maryland and the District of Columbia vicinity. Proc. Biol. Soc. Wash., 58:89-90.

MC CAULEY, Robert H. 1945. The Reptiles of Maryland and the District of Columbia. Pub. by author, Hagerstown, Md.

STEJNEGER, Leonhard. 1905. A snake new to the District of Columbia. Proc. Biol. Soc. Wash., XVIII:73-78.



Cemophora c. copei



Distribution in Maryland of
Cemophora c. copei

4. *Natrix erythrogaster erythrogaster* (Forster). Red-bellied Water Snake.

Although the red-bellied water snake has been known as a member of the Maryland fauna for over thirty years, not very many specimens exist in collections. All of these are from along the Pocomoke River in Wicomico County, except for a single specimen taken near Smithville, Dorchester County, and a single specimen from the head of the Severn River, Anne Arundel County. Despite the single occurrences elsewhere, it is obvious that the main populations of *erythrogaster* are along the Pocomoke. McCauley (1945) suggested that, ". . . it occurs along the entire length of the Pocomoke River, but may be difficult to collect . . ." Although it is rare in collections, and although it may not occur along the entire Pocomoke but rather in highly-specialized habitats, we do not now view this snake to be endangered in Maryland. As was the case with the carpenter frog, it is unlikely to maintain this status if many additional changes take place in the upper and middle Pocomoke swamps. See comments above under *Rana virgatipes*.

References:

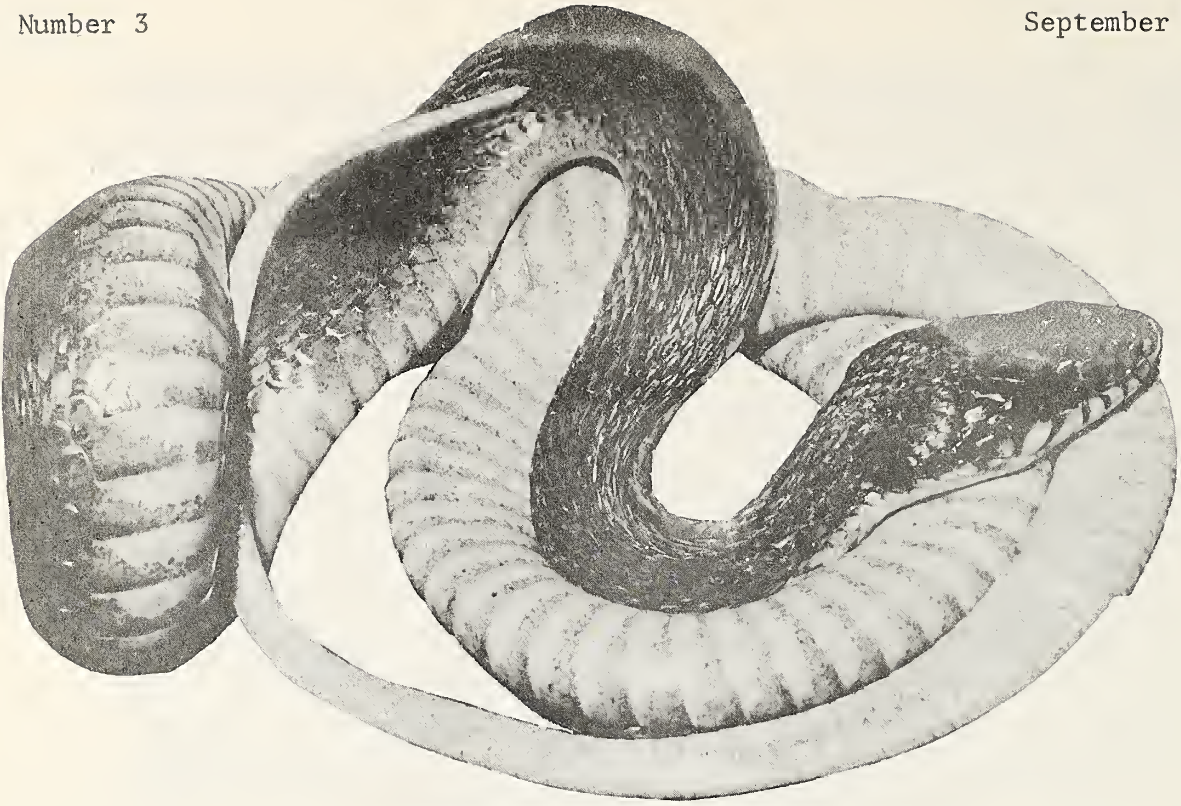
CONANT, Roger. 1943. *Natrix erythrogaster erythrogaster* in the northeastern part of its range. Herpetologica, 2(5):83-86.

__________. 1955. Notes on *Natrix erythrogaster* from the eastern and western extremes of its range. Nat. Hist. Miscellanea No. 147, 3 pp.

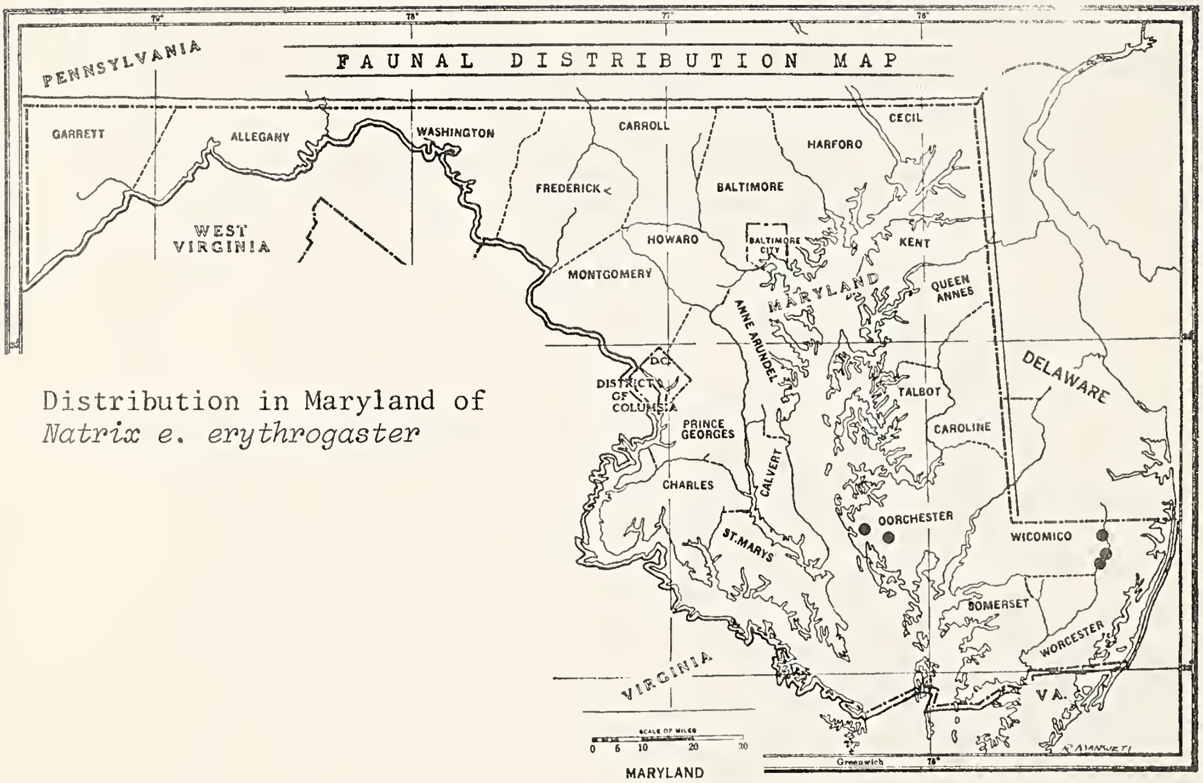
COOPER, John E. 1969. A red-bellied water snake from Maryland's Western Coastal Plain. J. Herpetology, 3(3-4):185-186.

MC CAULEY, Robert H. 1945. The Reptiles of Maryland and the District of Columbia. Pub. by author, Hagerstown, Md.

MEANLEY, Brooke. 1951. *Natrix erythrogaster* in the austroriparian zone of Maryland. Proc. Biol. Soc. Wash., 64:60.



Natrix e. erythrogaster



Distribution in Maryland of
Natrix e. erythrogaster

5. *Pituophis melanoleucus melanoleucus* (Daudin). Northern Pine Snake.

A number of older publications (e. g. Cope, 1900; Wallace, 1902; Stull, 1940) indicate the pine snake to be a well-known inhabitant of Maryland, but no substantiating evidence exists. The most convincing and nagging arguments that it ever was a member of the Maryland herpetofauna were presented by McCauley (1945) and Grogan (1973). Anecdotal evidence indicates that two specimens have been taken in Worcester County, one from near Snow Hill and the other from Isle of Wight, north of Ocean City. Conant (1958) did not include Maryland in the range of this snake. Cooper (1960) suggested that, in the absence of specimens, these records might best be considered invalid. Harris (1969) excluded the species from his distributional survey. Recently, Grogan (1973) reported a specimen collected on Maryland's western shore at Fort Meade. He also points out that the habitat on the western shore is similiar to the habitat found in the New Jersey pine barrens and that the habitat now present on the eastern shore of Maryland is not typical of the habitat associated with *melanoleucus* in the northern part of its range. It is our opinion that the occurrence of *Pituophis* at Fort Meade is questionable since this post is heavily manned and no additional specimens have ever been reported. Fort Dix in New Jersey is within the habitat of *Pituophis* and personnel exchange between Fort Meade and Fort Dix does exist. It is conceivable that an individual, herpetologically oriented or not, would capture a snake such as *Pituophis m. melanoleucus* for a curiosity, pet, etc. and may have possibly sent it, or have been transferred to Fort Meade from where the specimen was released or escaped. Thus, since the status of *Pituophis* as a member of the Maryland fauna is open to serious question, no constructive purpose would be served at this time by requesting its inclusion in the endangered species list. It should be noted that the snake, although secretive, is not altogether rare further north in the pine barrens of southern New Jersey. Most suitable habitat has certainly been destroyed by development in the Ocean City and Isle of Wight areas, but further collecting may one day see the species turn up in Worcester County. Rumors of its occurrence in some areas along Chincoteague Bay (Lee, 1973) have yet to be checked by qualified investigators. Considerable development is planned for Worcester County, especially along the coast, and any potential habitat for this snake will be further diminished by these activities.

References:

CONANT, Roger. 1957. A Field Guide to Reptiles and Amphibians. Houghton Mifflin Co., Boston. 366 pp.

COOPER, John E. 1960. Distributional Survey V: Maryland and the District of Columbia. Bull. Phila. Herp. Soc., May-June:18-24.

COPE, Edward D. 1900. The crocodilians, lizards, and snakes of North America. Rep. U. S. Nat. Mus. 1898:155-1294.

GROGAN, William L, Jr. 1973. A northern pine snake, *Pituophis m. melanoleucus* from Maryland. Bull. Md. Herp. Soc., 9(2): 27-30.

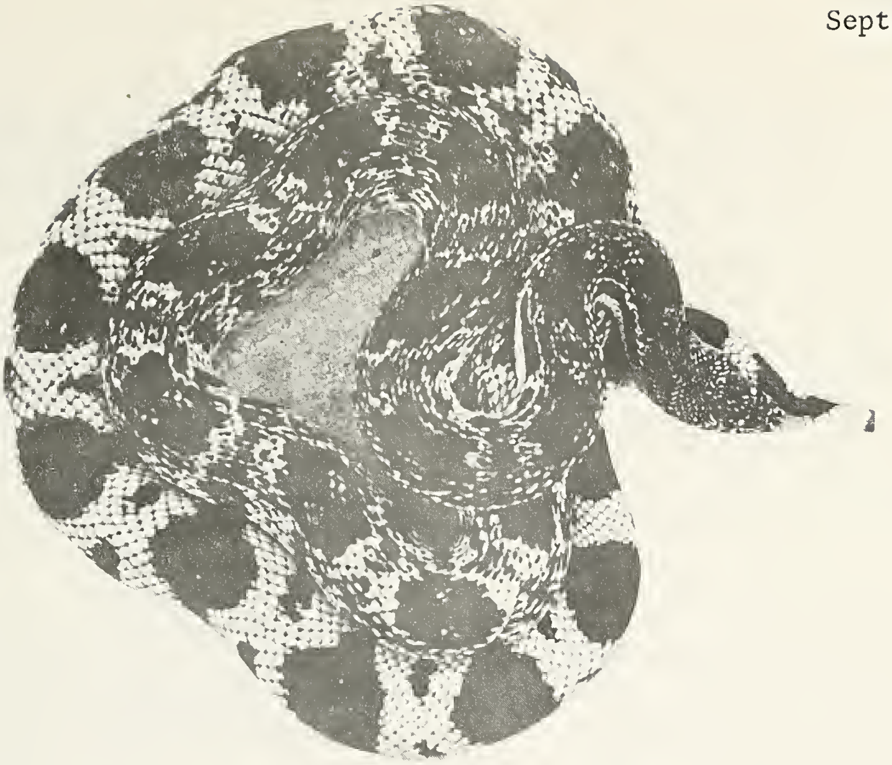
HARRIS, Herbert S., Jr. 1969. Distributional Survey: Maryland and the District of Columbia. Bull. Md. Herp. Soc., 5(4):97-161.

LEE, David S. 1972. List of the amphibians and reptiles of Assateague Island. Bull. Md. Herp. Soc., 8(4):90-95.

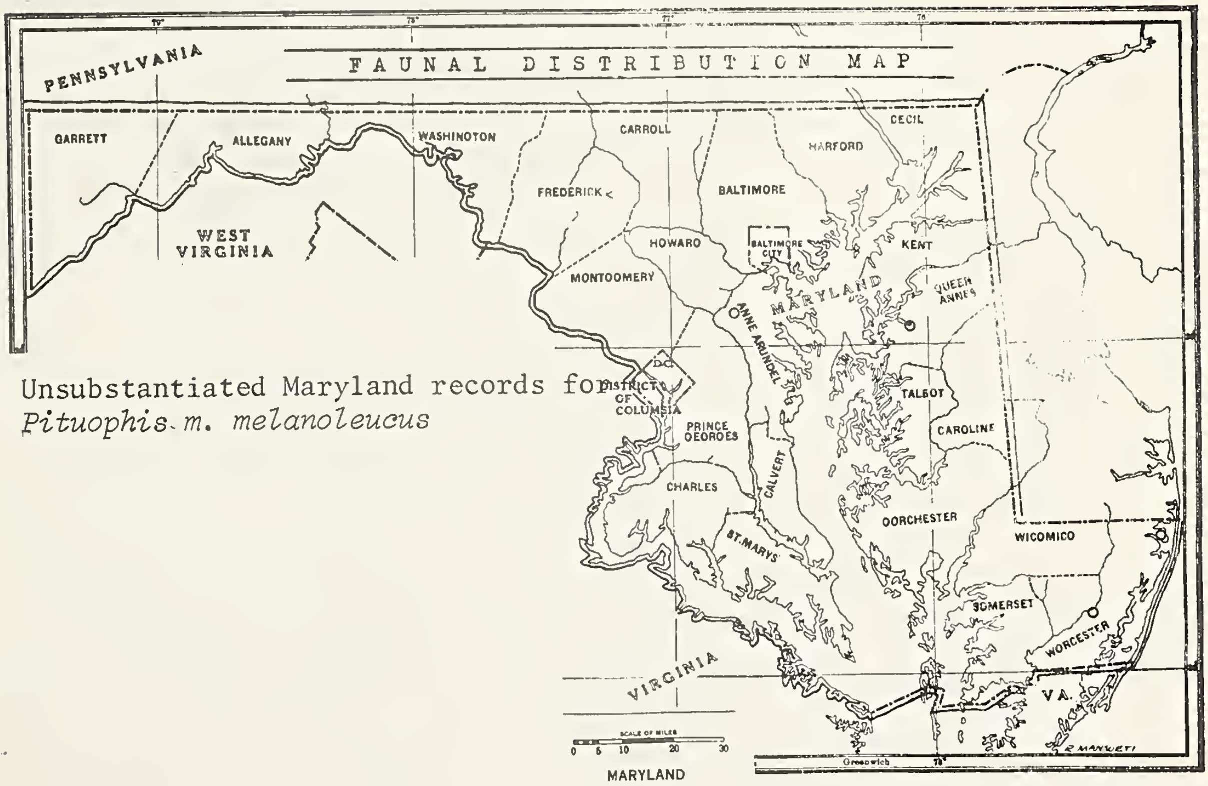
MC CAULEY, Robert H. 1945. The Reptiles of Maryland and the District of Columbia. Pub. by author, Hagerstown, Md.

STULL, Olive G. 1940. Variations and relationships in the snakes of the genus Pituophis. Bull. U. S. Nat. Mus. No. 175, 225 pp.

WALLACE, W. S. 1902. Snakes of Rockland County, New York. Rep. N. Y. State Museum No. 56, pp. 135-145.



Pituophis m. melanoleucus



Unsubstantiated Maryland records for *Pituophis m. melanoleucus*

COMMITTEE ON RARE AND ENDANGERED AMPHIBIANS AND REPTILES OF MARYLAND

Maryland Herpetological Society

John E. Cooper, Chairman
Associate Professor of Biology
Community College of Baltimore

L. Richard Franz
Florida State Museum

Frank Groves
Curator of Reptiles
Baltimore Zoo

Jerry D. Hardy, Jr.
Chesapeake Biological Laboratory

Herbert S. Harris, Jr.
Curator of Herpetology
Natural History Society of Maryland

David S. Lee
Curator of Mammalogy
Natural History Society of Maryland

Peter Wemple
Maryland Herpetological Society

Robert G. Tuck, *ex officio*
President, Maryland Herpetological Society

MARYLAND ENDANGERED SPECIES ACT

Article 66C, Section 125, Annotated Code of Maryland

Ch. 430, Acts 1971.

(a) Definitions. For the purposes of this Act, the term --

(1) "Fish and Wildlife" means any species or subspecies of any mammal, fish, wild bird, amphibian, reptile, mollusk or crustacean, or any part, products, egg or offspring thereof, or the dead body or parts thereof;

(2) "Person" means any individual, firm, corporation, association or partnership;

(3) "Secretary" means the Secretary of the Maryland Department of Natural Resources.

(b) Intent. The General Assembly of Maryland hereby finds that certain fish and wildlife are endangered and are entitled to preservation and protection as a matter of general state concern. The Federal Endangered Species Act of 1969 (16 U.S.C. Sec. 668AA-1 ET SEQ.) and the Lacey Act (18 U.S.C. Secs. 42-44) together provide for the protection of fish and wildlife threatened with worldwide extinction by prohibiting the importation of endangered fish and wildlife and by restricting and regulating interstate and foreign commerce in fish and wildlife taken in violation of state, federal, and foreign laws. The states, however, must also assume their responsibility for conserving these fish and wildlife and for restricting the taking, possession, transportation, processing or sale of endangered fish and wildlife within their respective jurisdictions to assure their continued survival and propagation for the aesthetic, recreational, and scientific purposes of future generations. The General Assembly finds that by eliminating the taking, possession, or marketing of endangered species in the State of Maryland, and by establishing a program for conservation and restoration of these endangered species, their potential for continued existence will be strengthened.

(c) Endangered Species.

(1) Notwithstanding any other provisions of this Article, the taking, transportation, possession, processing or sale within the State of Maryland of any fish and wildlife appearing on any of the following lists is prohibited, except as provided in subsection (e): (I) The United States List of Endangered Foreign Fish and Wildlife (Part 17 of Title 50 of the Code of Federal Regulations, Appendix A, as amended from time to time); (II) The United States' List of Endangered Native Fish and Wildlife (Part 17 of Title 50 of the Code of Federal Regulations, Appendix D, as amended from time to time); (III) Fish and Wildlife established as threatened with state-wide extinction, pursuant to the provisions of paragraphs (c) (2), (c) (3), and (c) (5).

(2) Forty-five days from the effective date of this Act, the Secretary shall issue a proposed list of fish and wildlife which he deems to be threatened with state-wide extinction in accordance with paragraph (c) (5), giving their common and scientific names by species and subspecies. Said order shall become effective forty-five days after it is issued during which period public comments will be solicited and received. The Secretary may hold a public hearing, if he deems it appropriate. The Secretary may thereafter amend such order prior to the effective date thereof to remove only such fish and wildlife which he

may determine are not threatened with state-wide extinction, as defined in paragraph (c) (5).

(3) The Secretary may, at any subsequent time, upon his own motion or upon the petition of three interested persons, conduct a Departmental review of any fish and wildlife on the state-wide list, provided that such persons present substantial scientific evidence to warrant such a review, and he may by order amend the state's list accordingly. This order shall be effective immediately upon issuance. The Secretary shall conduct a review of the state's endangered species list biennially hereafter and submit to the Governor a summary report of the scientific data used to support all amendments to the state's endangered species list during that biennium.

(4) The Secretary may remove any fish and wildlife from the state's endangered species list which has been removed from the Federal lists, provided he determines that the same fish and wildlife are no longer threatened with state-wide extinction.

(5) The Secretary shall inventory and investigate the status of all fish and wildlife which are found in this state to determine whether they are threatened with statewide extinction. For the purposes of this Act, fish and wildlife shall be deemed to be "threatened with state-wide extinction" whenever the Secretary determines, based upon the best scientific and commercial data available to him, and after consultation with other state game Directors, Federal agencies, and other interested persons and organizations, that the continued existence of such fish and wildlife is endangered in this state due to any of the following factors: (I) The destruction, drastic modification, or severe curtailment of its habitat, or (II) Its overutilization for commercial or sporting purposes, or (III) The effect on it of disease or predation, or (IV) Other natural or man-made factors affecting its continued existence.

(6) The Secretary is authorized to issue regulations to implement this subsection.

(d) Enforcement

(1) Except as provided in subsection (e), any person who violates the provisions of paragraph (c) (1), or any regulations issued pursuant thereto, shall be guilty of a misdemeanor and upon conviction shall be fined not more than $1,000.00.

(2) Any officer employed and authorized by the Secretary, or any Police Officer of the State of Maryland or any Police Officer of any municipality or county within the State of Maryland, shall have authority to execute a warrant to search for and seize any goods, business records, merchandise or fish and wildlife taken, employed, used, or possessed in connection with a violation of any subsection of this act. Any such Officer or agent may without a warrant, arrest any person who such employee has probable cause to believe is violating, in his presence or view, any such subsection, or any regulation or permit provided for by this Act. An Officer or agent who has made an arrest of a person in connection with any such violation may search such person or business records at the time of arrest and seize any fish and wildlife, records, or property taken, used or employed in connection with any such violation.

(3) Goods, merchandise, fish and wildlife or records seized under the provisions of paragraph (d) (2) shall be held by an Officer or agent of the

Maryland Department of Natural Resources pending disposition of court proceedings, and thereafter be forfeited to the state for destruction or disposition as the Secretary may deem appropriate; provided that, prior to forfeiture, the Secretary may direct the transfer of fish and wildlife so seized to a qualified zoological, educational or scientific institution for safekeeping, costs assessable to the defendant. The Secretary is authorized to issue regulations to implement this paragraph.

(e) Permits. The Secretary may permit, under such terms and conditions as he may prescribe by regulation, the taking, exportation, transportation or possession of any fish and wildlife which is threatened with state-wide extinction, for zoological, educational or scientific purposes and for propagation of such fish and wildlife in captivity for preservation purposes, unless such exportation, possession, transportation, or taking is prohibited or permitted by any Federal law or regulation, or any other law of the State of Maryland.

(f) Conservation.

(1) The Secretary shall conduct research on the endangered species of this state, and he shall utilize the land acquisition and other authorities vested in his office to carry out a program in Maryland for conserving, protecting, restoring, and propagating selected state endangered species. In addition to the land acquisition authorities vested in his office, the Secretary is hereby authorized to acquire by purchase, donation or otherwise, lands or interests therein needed to carry out the purposes of this act relating to the conservation, protection, restoration and propagation of selected state endangered species.

(2) The Governor shall review other programs administered by him and, to the extent practicable, utilize such programs in furtherance of the purposes of this Act. The Governor shall also encourage other State and Federal agencies to utilize their authorities in furtherance of the purposes of this Act.

(3) In carrying out the programs authorized by this Act, the Secretary shall cooperate to the maximum extent possible with the Federal Government, with other states, and with counties within the State of Maryland, and he may enter into agreements with the counties for the administration and management of any area established under this program for the conservation of the State's endangered species.

(g) Miscellaneous.

None of the provisions of this Act shall be construed to apply retroactively or to prohibit entry into the State of Maryland of fish and wildlife which may be lawfully imported into the United States or taken or removed from another state; provided that, this paragraph shall not be construed to permit the taking and removal from another state into this state of fish and wildlife on the federal endangered species lists.

Sec. 2. And be it further enacted, that if any provision of this Act or the application thereof to any person or circumstance is held invalid for any reason, the invalidity shall not affect the other provisions or any other application of this act which can be given effect without the invalid provisions or application, and to this end all the provisions of this Act are declared to be severable.

-- -- -- -- -- -- -- -- --
-- -- -- -- -- -- -- -- --

MARYLAND ENDANGERED SPECIES LIST

Issued March 1, 1972, effective 45 days from date of issuance:

Delmarva Peninsula Fox Squirrel - *Sciurus niger cinereus*
Coyote - *Canis latrans*
Bobcat - *Lynx rufus rufus*
Porcupine - *Erethizon dorsatum*
Least Weasel - *Mustela nivalis allegheniensis*
Mountain Lion - *Felis concolor*
Black Bear - *Ursus americanus*

Effective October 12, 1972:

Hellbender *(Cryptobranchus alleganiensis alleganiensis)*
Jefferson Salamander *(Ambystoma jeffersonianum)*
Eastern Tiger Salamander *(Ambystoma tigrinum tigrinum)*
Green Salamander *(Aneides aeneus)*
Eastern Narrow-mouthed Toad *(Gastrophryne carolinensis)*
Coal Skink *(Eumeces anthracinus anthracinus)*
Rainbow Snake *(Farancia erytrogramma erytrogramma)*
Mountain Earth Snake *(Virginia valeriae pulchra)*
Bog Turtle *(Clemmys muhlenbergi)*
Atlantic Green Turtle *(Chelonia mydas mydas)*
Atlantic Hawksbill Turtle *(Eretmochelys imbricata imbricata)*
Atlantic Loggerhead *(Caretta caretta caretta)*
Atlantic Ridley *(Lepidochelys kempi)*
Atlantic Leatherback *(Dermochelys coriacea coriacea)*

Photograph credits:

Page 46	Jerry D. Hardy, Jr., Herbert S. Harris, Jr.
48	Charles J. Stine
49	Charles J. Stine
52	Robert S. Simmons
55	Robert S. Simmons, Herbert S. Harris, Jr.
58	Robert S. Simmons
61	Robert S. Simmons
64	Robert S. Simmons
66	Robert S. Simmons
69	Robert S. Simmons, Ken Nemuras
72	Robert S. Simmons
75	Robert S. Simmons
77	Prescott Ward
80	Robert S. Simmons
83	Andrew Misulia
84	Robert S. Simmons
87	Robert S. Simmons
89	Robert S. Simmons
91	Robert S. Simmons
94	William V. Horvath

Natural History Society of Maryland
Maryland
Herpetological
Society

ISSN 0025-4231

BULLETIN OF THE

Maryland Herpetological Society

The Natural History Society of Maryland, Inc.

DECEMBER 1973 VOLUME 9 , NUMBER 4

Bulletin of the Maryland Herpetological Society
Volume 9 Number 4 December 1973

Contents

Seasonal breeding distributions for selected Maryland and Delaware amphibians..................................David S. Lee 101

An observation on the feeding habits of the eastern king snake....................................Calvert R. Posey 105

Early breeding activity of *Rana sphenocephala* and *Bufo woodhousei fowleri* in Maryland...............W. L. Grogan, Jr. & P. G. Bystrak 106

Another record for the queensnake in southern Maryland......................................David S. Lee 107

Notes on hatchling painted turtles, *Chrysemys p. picta*, from Maryland.........................W. L. Grogan, Jr. & G. L. Williams 108

Additional reptiles and amphibians from Assateague Island..David S. Lee 110

Red leg in a subterranean population of pickerel frogs.......................................David S. Lee 111

Hypsiglena ochrorhyncha ochrorhyncha (Cope) recorded from Cerralvo Island, Gulf of California, Mexico..........A. Powers & B. H. Banta 112

The amphibians and reptiles of Kent Island, Maryland.........................W. L. Grogan, Jr. & P. G. Bystrak 115

Library of Congress Catalog Card Number: 76-93458

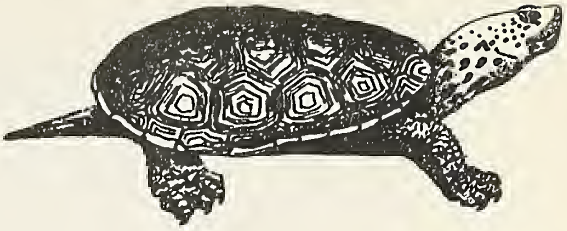
The Cover: A juvenile *Natrix e. erythrogaster*. Photograph by Dr. Robert S. Simmons.

Ed. Note: Manuscripts being submitted for publication should be typewritten (double spaced) on good quality 8-1/2 by 11 inch paper, with adequate margins. Submit original and first carbon, retaining the second carbon. Indicate where illustrations or photographs are to appear in text. Cite all literature used at the end in alphabetical order by author. Reprints are available at $.01 a page ($.02 a page with photographs) and should be ordered when manuscripts are sent in. Minimum order 100 reprints.

MdHS........a founder member of the Eastern Seaboard Herpetological League

The Maryland Herpetological Society, Department of Herpetology, Natural History Society of Maryland, Inc., 2643 North Charles Street, Baltimore, Maryland 21218.

BULLETIN OF THE mdhs



Volume 9 Number 4 31 December 1973

The Maryland Herpetological Society
Department of Herpetology, Natural History Society of Maryland, Inc.

Bulletin Staff

Executive Editor Herbert S. Harris, Jr.

Associate Editors (this issue) John Funk, Jr., Brian Leverton

Steering Committee

John E. Cooper
Frank Groves
John D. Groves
Jerry D. Hardy, Jr.
Herbert S. Harris, Jr.
- Jeremy Jacobs
- Arnold Norden
- Mark J. Prihoda
- Margaret M. Thomas
- Peter Wemple

Officers

President..........Brian Leverton
Vice-President......John Funk, Jr.
Secretary..........Daniel Carver
Treasurer..........William M. Marvel
Typist.............Donna Marvel

Membership Rates

Active members over 18...$10.00, under 18...$6.00, subscribing members (outside a 20 mile radius of Baltimore City)...$3.00, Foreign...$4.00 per year.

Meetings

The third Saturday of each month, 9:45 a.m. at the Natural History Society of Maryland (Except May-Aug., 8:00 a.m.). The Department of Herpetology meets informally every Wednesday evening at the NHSM at 8:00 p.m.

Ed. Note: The "Herpetological Distributional Survey: Maryland and the District of Columbia" planned for this issue is still under way. My time, of lately, is limited but I will try and get the survey out as soon as possible.

Seasonal Breeding Distributions for Selected Maryland and Delaware Amphibians

David S. Lee

The following information is principally collected from data which I have gathered over the last five years. Notes from earlier years, information collected from colleagues, publications on local amphibians, and notes from the Natural History Society of Maryland were also used. I have not religiously attempted to track down every possible source of information. Nevertheless, I believe that this preliminary record of the breeding seasons of Maryland and Delaware amphibians should be useful, both as information on seasonal breeding patterns, and as a tool for field workers, enabling them to recognize (and hopefully report) breeding activities which appear to be seasonally unusual.

In an attempt to get unbiased samples of reproductive periods I have collected breeding records for coastal plain, piedmont and Allegheny plateau populations for most of the widely distributed species.

Comparative seasonal reproductive frequency is indicated by three different widths of lines. A heavy line suggest that the species appears to carry out the major part of its breeding activity during that period of the year; six or more records are available for that portion of the month. A medium line indicates normal variations in breeding periods and is based, for the most part, on records gathered during periods of unusual weather. This line is represented by three to five records. A light line, 1 or 2 records, indicates unusually early or late periods of breeding activity or activity in extreme corners of the state (i.e., lower Delmarva or Garrett County) where spring arrives much earlier or later than in the rest of the state. Records were compiled for calendar weeks. Extreme known breeding dates, when shown, are indicated with a number which represents a known calendar date. A dashed line shows sporadic breeding records for that species.

The following species have been omitted: *Necturus maculosus*, *Aneides aeneus*, *Plethodon richmondi*, *Pseudotriton ruber*, *P. montanus*, and *Siren lacertina*. This is due to lack of valid local records concerning reproductive patterns. Information on *Cryptobranchus alleganiensis*, *Hemidactylium scutatum*, *Gyrinophilus porphyriticus*, and *Desmognathus monticola* is scarce. Records for *Plethodon glutinosus* are taken exclusively from Highton (1962). For all other species reproductive records came from two or more sources.

Reproductive dates were determined by 1) massive breeding migrations, 2) calling males, 3) recently deposited eggs, and/or 4) the presence of full term, pigmented eggs in dissected females.

Many of our native amphibians are explosive breeders, all arriving at the breeding areas and depositing eggs within a very short period of time. The spadefoot toad, *Scaphiopus holbrooki*, is perhaps the single best example of an explosive breeder, but many other species likewise finish their reproduction in relatively short order, their reproduction being completed in a week or less. Other species are protracted breeders, spreading their breeding out over long periods of time.

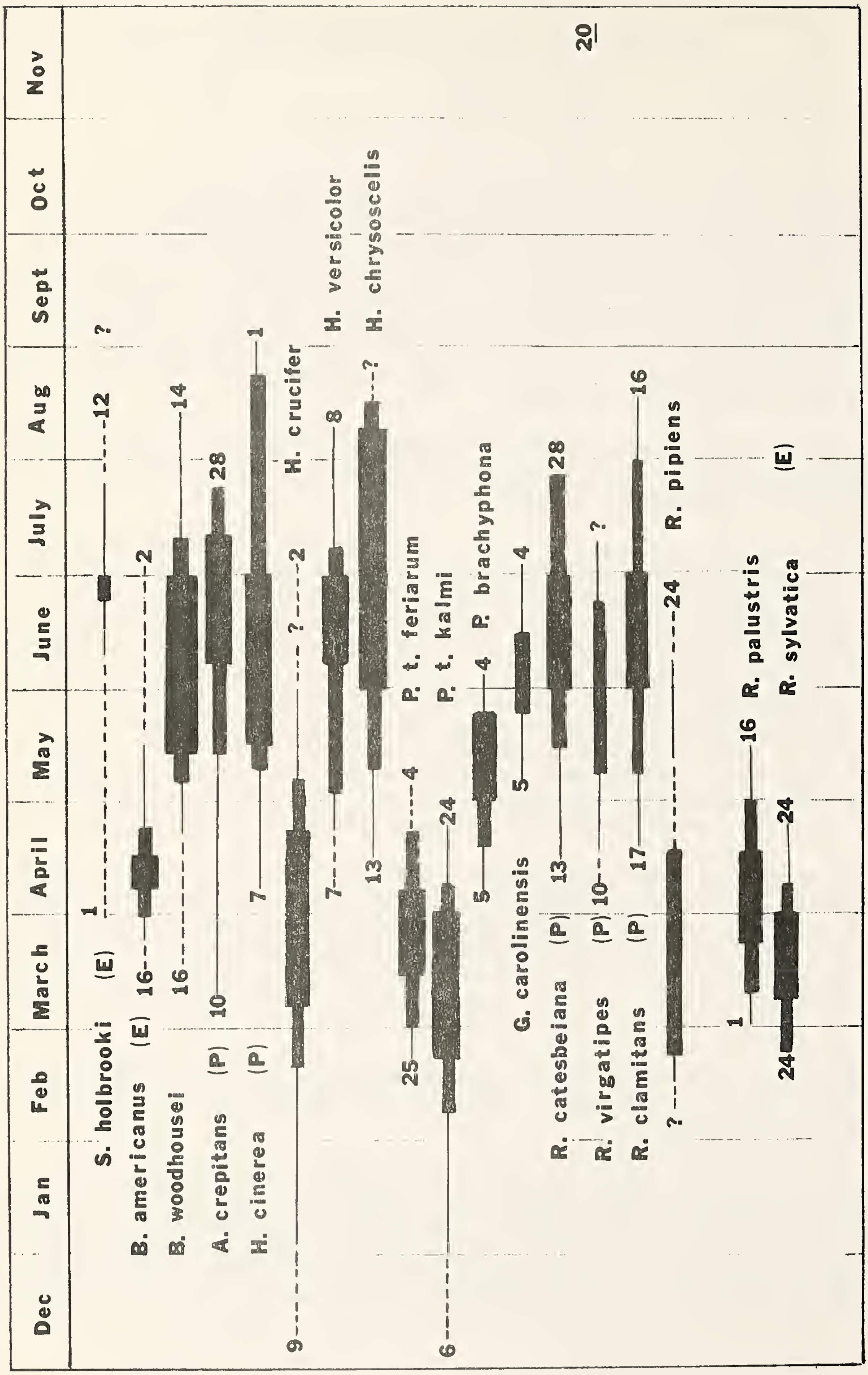


Figure 1: Seasonal Breeding Distributions for Selected Maryland and Delaware Frogs

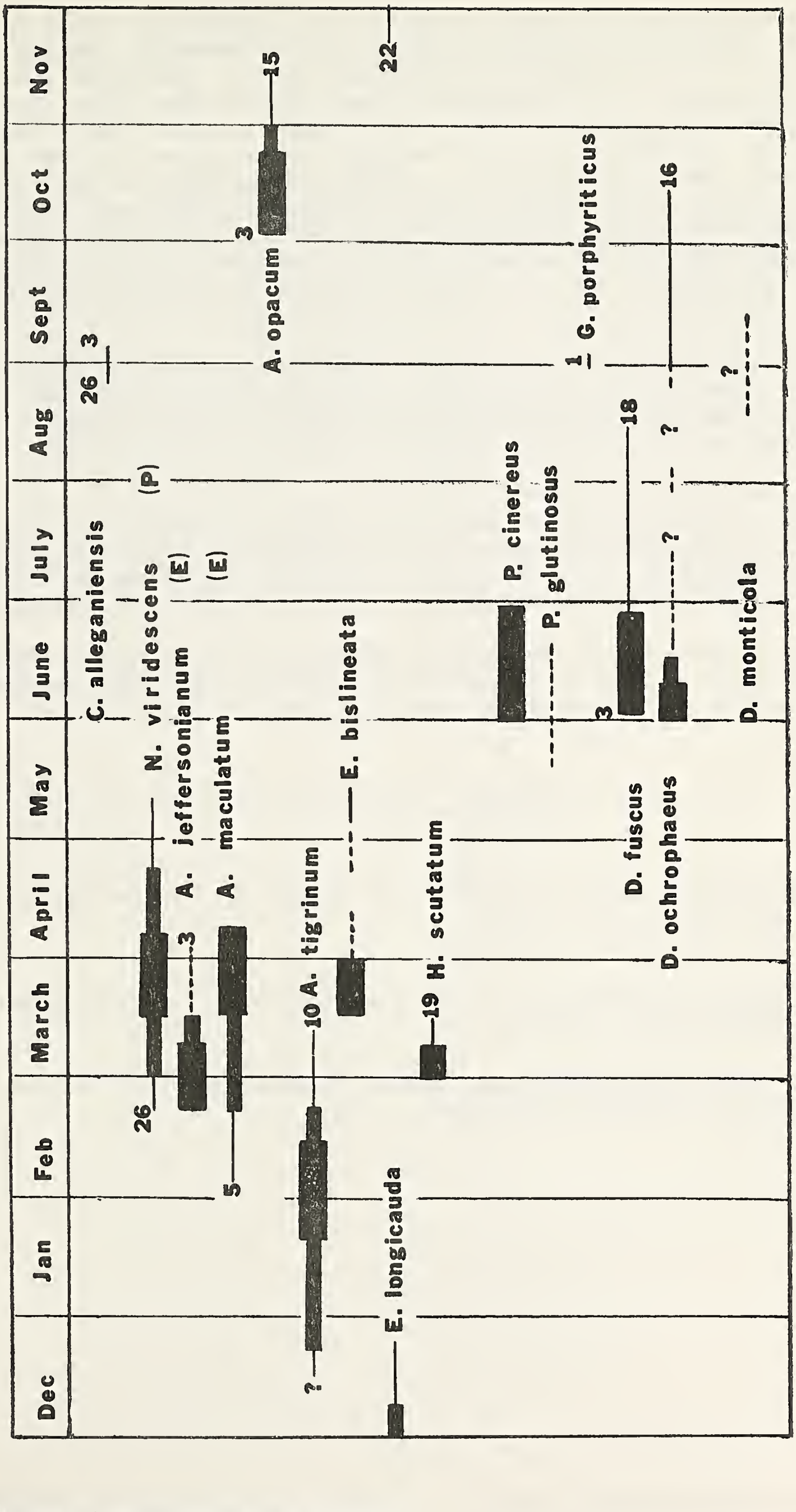


Figure 2: Seasonal Breeding Distributions for Selected Maryland and Delaware Salamanders

Bullfrogs, *Rana catesbeiana*, and newts, *Notophthalmus viridescens*, are good examples for this type of reproduction. Most other species fall somewhere between these two extremes, and many can be classified as either explosive or protracted breeders. I point this out only because the accompanying charts fail to show this. Populations which finish reproductive activity in one or two nights or those which can be found breeding almost any time throughout their breeding season appear the same on the charts. Therefore, those species which are definitely explosive or protracted breeders are so marked (i.e., E. P.) on the charts. Generally populations that have to migrate great distances to breeding sites are explosive breeders, since there is a definite advantage to having the majority of the population at the breeding site at the same time. Protracted breeders, on the other hand, are usually permanent residents in the breeding area.

Several species call at odd times in the year--spring peepers, *Hyla crucifer*, and leopard frogs, *Rana pipiens*, for example. To the best of my knowledge there is no evidence that this is accompanied by reproduction in these species. Therefore, I have chosen not to show these bizarre calling times (mostly fall) on the charts.

I would like to thank L. Richard Franz, for much of the data presented in Fig. 1 and 2. In order to prevent accumulating a Literature Cited section that would be considerably longer than this note I will refer the reader to the references listed by Harris (1969), most of which were checked during preparation.

Hopefully, additional data will warrant updating this from time to time. I would appreciate people calling to my attention references which I missed and supplying information which will affect the seasonal status of these species.

Literature Cited

Harris, H. S. Jr.
1969. Distributional survey: Maryland and the District of Columbia. *Bull. Md. Herp. Soc.* 5(4): 97-161.

Highton, R.
1962. Geographic variation in the life history of the slimy salamander. *Copeia* 1962 (3): 597-613.

——David S. Lee, *Department of Mammalogy, Natural History Society of Maryland, 2643 N. Charles Street, Baltimore, Maryland.*

Received 6 July 1973

An Observation on the Feeding Habits of the Eastern King Snake

An eastern king snake, *Lampropeltis getulus getulus*, was observed feeding near the confluence of the Potomac River in Charles County, Maryland. When first observed, the snake was in the process of uncovering and swallowing the eggs of one of the small turtles; either the painted, spotted or box turtles which are common in this area. The nest was about five feet from the river shore in sandy soil. The snake pushed its head sideways which loosened the soil, then with a flip-like motion of its head, threw the loosened soil out of the hole. This process was repeated until one egg was uncovered and eaten. After about ten minutes, the snake was caught and examined to see if it was possible to determine how many eggs had been eaten. Although the abdomen was distended, no individual eggs could be felt. After releasing, the snake moved away and hid under debris about ten feet from the turtle nest. The turtle nest was covered with the soil. Upon returning about two hours later, the nest was found to have again been excavated. All remaining eggs were gone and the clear imprint of a snake's body could be seen in the loosened soil. A check of the area revealed a king snake of the same size and coloration. When released, the snake disappeared under the same pile of debris as had the snake earlier in the day.

It appeared that the same snake had returned to the turtle nest to feed after being caught and examined.

—Calvert R. Posey, *Division of Biological Sciences, Charles County Community College, La Plata, Maryland, 20646.*

Received 28 July 1973

Early Breeding Activity of *Rana sphenocephala* and *Bufo woodhousei fowleri* in Maryland

On 3 February 1973, adult southern leopard frogs, *Rana sphenocephala,* were observed and collected by the authors at Irish Grove Wildlife Sanctuary near Marion, Somerset County, Maryland. The frogs were active and were found in marshes and fields but were not heard calling on this date. On 3 March leopard frogs were observed calling in large numbers at the same locality. They were very active and were found on the paved roads at night in great abundance. On 16 March at the same locality leopard frogs were again very common and apparently still breeding as large choruses were in evidence. Large numbers of egg masses were observed on this date and hatching was beginning in some of these masses. This indicates that breeding may have begun as early as the middle of February and at the latest at the end of that month.

On 16 March, Fowler's toads, *Bufo woodhousei fowleri,* were also found in large choruses at the same locality as above. Toads were active at night on the roads and both males and females were collected. No specimens were actually observed in amplexus and no egg masses were observed but breeding may have taken place. This species usually begins breeding activity in late April and continues to breed through May in Maryland (Harris, 1969). This may represent the earliest observed date of breeding activity for this species in the state and is perhaps the earliest recorded active date as well.

We are at a loss to explain why these two species should exhibit breeding activity this early in the year as temperatures were not excessively above normal for this period.

Literature Cited

Harris, Herbert S., Jr.
1969. Distributional Survey: Maryland and the District of Columbia. *Bull. Md. Herp. Soc.* 5(4): 97-161.

——William L. Grogan, Jr. and Paul G. Bystrak, *Department of Entomology, University of Maryland, College Park, Maryland, 20742.*

Received 29 June 1973

Ed. note: These data have been incorporated into the breeding data contained in the article on page 101.

Another Record for the Queen Snake in Southern Maryland

In 1962, Hardy and Mansuetti reported the queen snake, *Natrix septemvittata*, from near Solomons, Calvert County, Maryland. Harris (1969) considers this locality outside the expected range of the species and mentions that specimens were not available to document the Hardy-Mansuetti record.

On 9 June 1973, Robert Chance showed me two young queen snakes that he and several campers had captured in a small stream on the property of King's Landing Camp. (We were all attending a weekend junior nature camp sponsored by the Maryland Ornithological Society.) This camp is near Huntington, Calvert County. The area consists of typical coastal plain hardwoods (i.e., spanish oak, *Quercus falcata;* willow oak, *Q. phellos;* sweet gum, *Liquidambar styraciflua;* muscadine grape, *Vitis rotundifolia;* and other coastal plain indicator species abound). The stream from which the two snakes were collected drains directly into the Patuxent River, which at this point, is still under tidal influence. Both sides of the river support extensive marshes of arrow arum, *Peltandra virginica;* arrow-head, *Sagittaria* sp; and narrow-leaved cat-tails, *Typha angustifolia.*

It appears that this note, and Hardy and Mansuetti's record provide the only known localities for this species in southern Maryland. One of the above-mentioned specimens has been placed in the collection of the Natural History Society of Maryland (R 1799 NHSM, 215 mm total length), the other was released. I would like to thank Robert Chance for making the specimens available.

Literature Cited

Hardy J. D. and R. J. Mansueti
1962. Checklist of the amphibians and reptiles of Calvery County, Maryland. *Nat. Res. Inst. Univ. Md.* Ref. No. (62-34): 1-12.

Harris, H. S.
1969. Distributional survey: Maryland and the District of Columbia. *Bull. Md. Herp. Soc.* 5(4): 97-161.

——David S. Lee, *Department of Mammalogy, Natural History Society of Maryland, 2643 N. Charles Street, Baltimore, Maryland.*

Received 1 August 1973

Notes on Hatchling Painted Turtles, *Chrysemys p. picta,* from Maryland

Since little is known about reproduction in the painted turtle, *Chrysemys p. picta* in Maryland, the following may be of interest.

Hartweg (1944, 1946) was first to publish evidence that this species overwinters in the nest in Michigan after hatching in October. He also found that emergence occurs the following spring from 25 March to 24 April. Similar observations have been made by Finneran (1948) in Connecticut, Sexton (1957) in Michigan, Williams (1957) in Illinois, and Woolverton (1961, 1963) in Minnesota. McCauley (1945) indicated that hatching probably occurs during September in Maryland and that the young may hibernate in the nest.

On 3 April 1973 at Fort Meade, Anne Arundel County, Maryland the junior author collected 4 hatchling painted turtles, *C. p. picta.* The specimens were taken with egg shell fragments in a single sweep of an aquatic insect net approximately 6 inches below the substrate in 24 inches of water. All of the hatchlings exhibited umbilical scars and egg teeth. Measurements of 3 specimens appear in Table 1 below.

Specimen	1	2	3
Carapace Length	26	27	26
Plastron Length	24	25	24

Table 1. Sizes of Hatchling Painted Turtles in mm.

It is possible that these hatchlings overwintered in the egg but it is more likely that they hatched in the fall and hibernated in the nest. We are unable to explain why the nest site would be covered to such a depth with water. Also puzzling is that the hatchlings had not dispersed from the nest, for it would seem that the water present would facilitate their escape from the nest. On 6 June the nest site was again visited at which time it was just slightly above the water line. It would seem that this site would have to remain above the water level at least until the embryos were nearly developed in order to insure survival of the hatchlings. This pond is for the most part permanent, only drying up during very dry and hot summers.

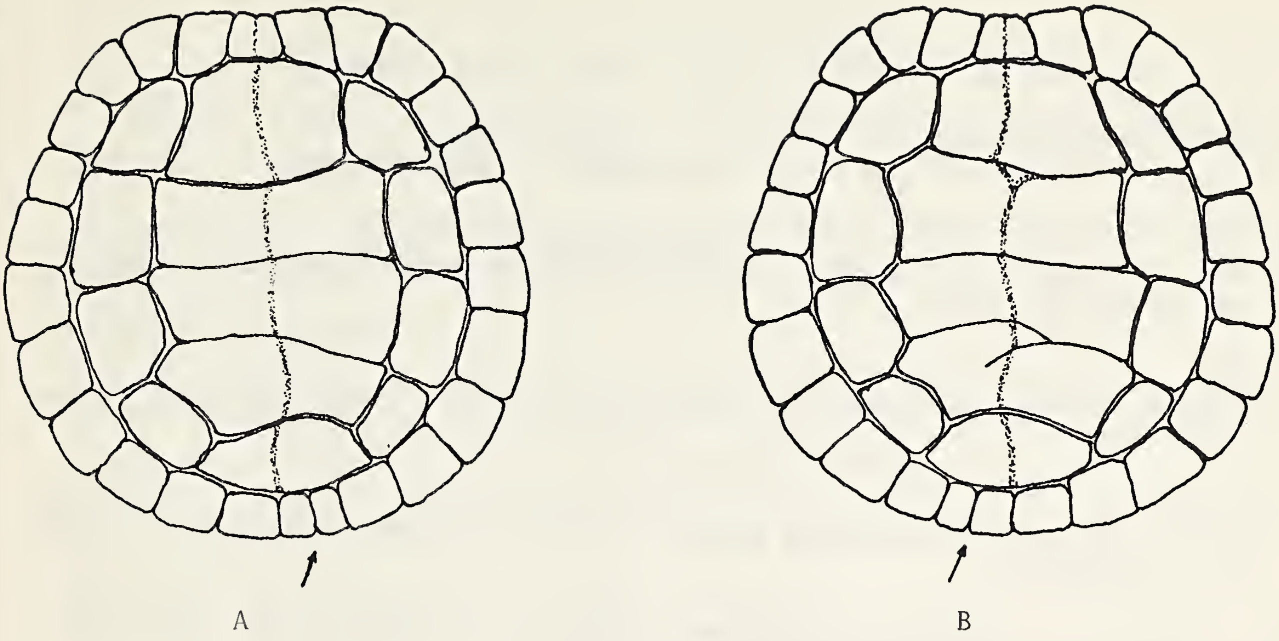


Fig. 1 Dorsal Scute Arrangement of Hatchling Painted Turtles

Two of the hatchlings exhibited carapace scute abnormalities (Fig. 1). Specimen A has 13 right marginals and 12 left marginals while specimen B has 12 right marginals and 13 left marginals. Comparing the total arrangement of the scutes for both specimens shows specimen A to be nearly a mirror image of specimen B except for vertebrals 3 and 4. Vertebral 4 of specimen B is partially divided diagonally and is similar to a specimen of *Chrysemys picta* reported by Sturn and Brattstrom (1957) in which all of the vertebrals were divided diagonally.

Literature Cited

Finneran, L. C.
1948. Reptiles at Branford, Connecticut. *Herpetologica* 4: 123-126.

Hartweg, N.
1944. Spring emergence of painted turtle hatchlings. *Copeia* (1): 20-22.

_______________.
1946. Confirmation of overwintering in painted turtle hatchlings. *Copeia* (4): 255.

McCauley, R. H.
1945. *The Reptiles of Maryland and the District of Columbia.* Pub. by author. Hagerstown, Maryland.

Sexton, O. J.
1957. Notes concerning turtle hatchlings. *Copeia* (3): 229-230.

Sturn, A. and B. H. Brattstrom.
1957. A serial abnormality in the painted turtle. *Herpetologica* 13: 277-278.

Williams, K. L.
1957. Possible overwintering of a turtle egg in east-central Illinois. *Herpetologica* 13: 248.

Woolverton, E.
1961. Winter survival of hatchling painted turtles in northern Minnesota. *Copeia* (1): 109.

______________.
1963. Winter survival of hatchling painted turtles in northern Minnesota. *Copeia* (3): 569-570.

—William L. Grogan, Jr. and Gaye L. Williams, *Department of Entomology, University of Maryland, College Park, Maryland, 20742.*

Received 29 June 1973

Additional Reptiles and Amphibians from Assateague Island

Since a recent listing of reptiles and amphibians of Assateague Island (Lee, 1972) two additional species have come to my attention.

Pseudacris triseriata -- This frog is apparently common on the south end of the island. Several large choruses were heard from fresh water ponds in the Chincoteague National Wildlife Refuge during the winter and spring months (1973).

Terrapene carolina -- John Wise, naturalist for the Assateague National Seashore, informed me that box turtles occurred on the south end of the island in the lobolly pine forest. He showed me one specimen.

Although I have no specific records for either of these species from the Maryland portion of the island, good habitats (i.e., fresh water ponds and pine forest) extend for several miles north of the Md.-Va. line. I assume these two animals do likewise.

Literature Cited

Lee, David S.
1972. A list of the amphibians and reptiles of Assateague Island. *Bull. Md. Herp. Soc.* 8(4): 90-95.

——David S. Lee, *Department of Mammalogy, Natural History Society of Maryland, 2643 N. Charles St., Baltimore, Maryland, 21218.*

Received 6 July 1973

Red Leg in a Subterranean Population of Pickerel Frogs

Franz (1966) previously discussed red leg in a natural population of amphibians. Additional records of this infection on non-captive frogs are few.

On 13 January 1970 we visited a small mine in Lancaster County Pennsylvania. In a water filled depression near the rear of the mine a dead adult pickerel frog, *Rana palustris*, was found with a severe case of red leg. Two live individuals were captured; upon examination it was discovered that these frogs were likewise infected. The deep pools in which the frogs were living were clear and cold (13°C); a striking contrast to the conditions with which red leg is usually associated.

No other verterbrates were observed in this mine with the exception of two species of hibernating bats (*Pipistrellus subflavus* and *Eptesicus fuscus*).

Literature Cited

Franz, L. R.
1966. Red leg in a natural population of Maryland amphibians. *Bull. Maryland Herpetological Society.* 2(2): 7.

——David S. Lee and L. Richard Franz, *Department of Mammalogy, Natural History Society of Maryland and Florida State Museum, University of Florida.*

Hypsiglena ochrorhyncha ochrorhyncha (Cope) Recorded from Cerralvo Island, Gulf of California, Mexico

Among the herpetological specimens secured from Cerralvo Island in January 1973, is an example of the peninsula form of *Hypsiglena ochrorhyncha ochrorhyncha* (Cope) which consitutes a new insular record for that species. See figure 1-3. This specimen resembles three specimens of *H. o. ochrorhyncha* from San Jose Island (SDSNH 3815, 3816, and 44379) and two specimens examined from San Francisco Island (SDSNH 44377 and 44378). These islands are located approximately 50 to 60 nautical miles northwest in the Gulf of California. Soulè (1961) reported *Eridiphas slevini* (Tanner) on Cerralvo Island. This specimen now suggests that a possible sympatric relationship might exist between these two forms on the island as it might on the adjacent Baja California peninsula (Tanner 1966). The meristic and morphometric data of this specimen is compared with comparable published information in Table 1. This specimen is catalogued R 1801 NHSM in the collections of the Natural History Society of Maryland.

The expedition was partially sponsored by the Natural History Society of Maryland, Inc., through the generosities of Mr. Herbert S. Harris, Jr. and Dr. Robert S. Simmons. Mr. Clark Mahrdt, San Diego Society of Natural History (SDSNH) provided access to the society's extensive collections. Photographs were provided by Mr. Roy Porello.

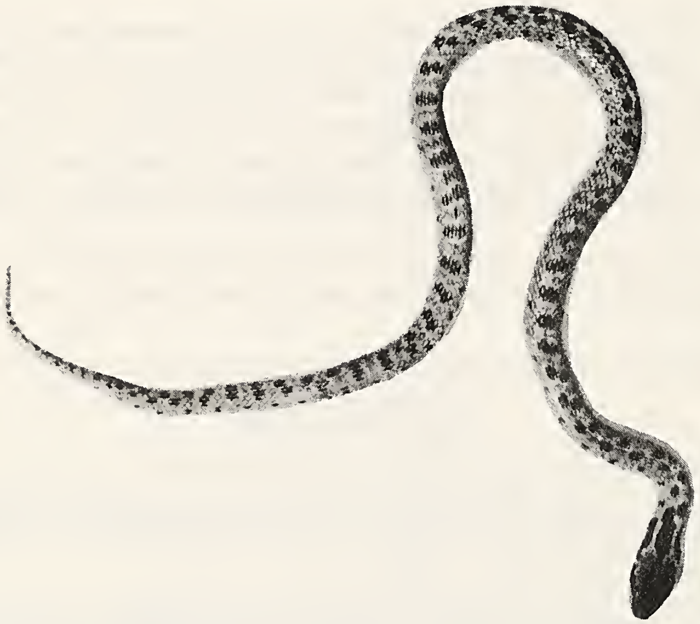


Figure 1: Dorsal view of Cerralvo Island *Hypsiglena ochrorhyncha ochrorhyncha*

TABLE 1

Comparative Meristic and Morphometric Data for Baja California Night Snakes from the Cape Region and Gulf of California Islands

Species	Sex	Scale Rows	Ventrals	Subcaudals	No. of Spots	Length (mm.)	Nape Pattern	Source
*HYPSIGLENA OCHRORHYNCHA**	♂ ♂	21-19-17	154-195 (177)	45-66 (50)	39-75 (54)	479	one band or	Tanner (1946)
"	♀ ♀	21-19-17	162-204 (185)	38-47 (46)	38-95 (58)	642	3 spots	"
**	♀	21-19-17	178	43	75	395	3 spots	New Record
*ERIDIPHAS SLEVINI****	♂	21-23-21	190	68	52	217	5 spots	Tanner (1946)
"	♀	21-23-17	186	58	63	486	5 spots	Soulè (1961)

* Includes San Jose Island specimens (SDSNH 3815 and 3816).

** Specimen from Cerralvo Island, Gulf of California, Mexico.

*** Transferred to the monotypic genus *Eridiphas* (Leviton and Tanner 1960).

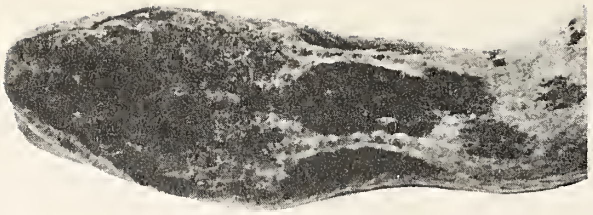


Figure 2: Dorsal view of the head of Cerralvo Island *H. o. ochrorhyncha* showing nape pattern and anterior spotting

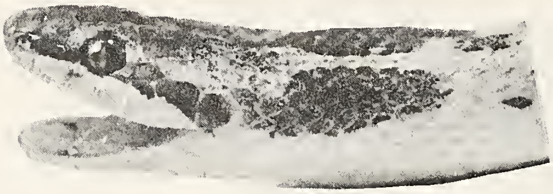


Figure 3: Left side view of head of *H. o. ochrorhyncha* showing nape pattern

Literature Cited

Dixon, J. R.
1965. A taxonomic re-evaluation of the night snake *Hypsiglena ochrorhyncha* and relatives. *Southwest. Nat.* 10(2): 125-131.

Leviton, A. E. and W. W. Tanner
1960. The generic allocation of *Hypsiglena slevini* Tanner (Serpentes: Colubridae). *Occas. Pap. Calif. Acad. Sci.* 27: 1-7, 2 figs.

Soulè, M. E.
1961. *Eridiphas slevini* (Tanner) on Cerralvo Island, Gulf of California, Mexico. *Herpetologica* 17(1): 61.

Tanner, W. W.
1946. A taxonomic study of the genus *Hypsiglena*. *Great Basin Nat.* 5(3-4): 25-92, pls. 1-3, map.

________________.
1966. The night snakes of Baja California. *Trans. San Diego Soc. Nat. Hist.* 14(15): 189-196.

—Arnold Powers, *Department of Biology, University of Colorado, Boulder, 80302.*
—Benjamin H. Banta, *Department of Biology, United States International University, San Diego, California, 92131.*

Received 28 July 1973

The Amphibians and Reptiles of Kent Island, Maryland

William L. Grogan, Jr. and Paul G. Bystrak

Kent Island is located in the central portion of the Chesapeake Bay and is separated from the mainland of the Eastern Shore by Kent Island Narrows, a narrow inlet. The topography of the island is essentially flat, with elevations varying from sea level to 23 feet. The island is 14.5 miles long and 6 miles wide at its widest point, but it is deeply dissected by numerous creeks and ponds so that there is no one large mass of land. About 60% of the land is in agriculture fields with the remainder in loblolly pine forests and fresh and brackish marshes. Since this island has been continuously inhabited longer than most areas of the United States, human activities may have played an important role in determining the herpetofauna present.

The authors have collected sporadically on the island since 1965 and during the summers of 1969-71 did field work there. The following list of 22 species of amphibians and reptiles from Kent Island represents our observations during the last eight years. Admittedly, other species are indigenous to the island and should be searched for in the future.

We would like to thank Walter J. Nixon who worked with us on the island and made suggestions concerning some of the species reported here. We would also like to thank Dr. Donald H. Messersmith who enabled us to make some of these observations while working for Project NE-49 (Control of Bird Depradations).

List of Species

Ambystoma maculatum Spotted Salamander. Harris (1969), indicates a locality record for this species from Kent Island and certainly there is suitable habitat available for it, but it was not observed by the authors.

Plethodon c. cinereus Redbacked Salamander. Specimens were taken in wooded situations from the southern portion near Kent Point. Harris (1969), also records this species near this locality.

Bufo woodhousei fowleri Fowler's Toad. Very common on the island and found in a variety of habitats.

Acris c. crepitans Northern Cricket Frog. Specimens were heard calling in marshes near Kent Point. Harris (1969), also records this species from the central portion of the island.

Hyla c. crucifer Northern Spring Peeper. Specimens were observed at Kent Point and it has been heard calling at various localities.

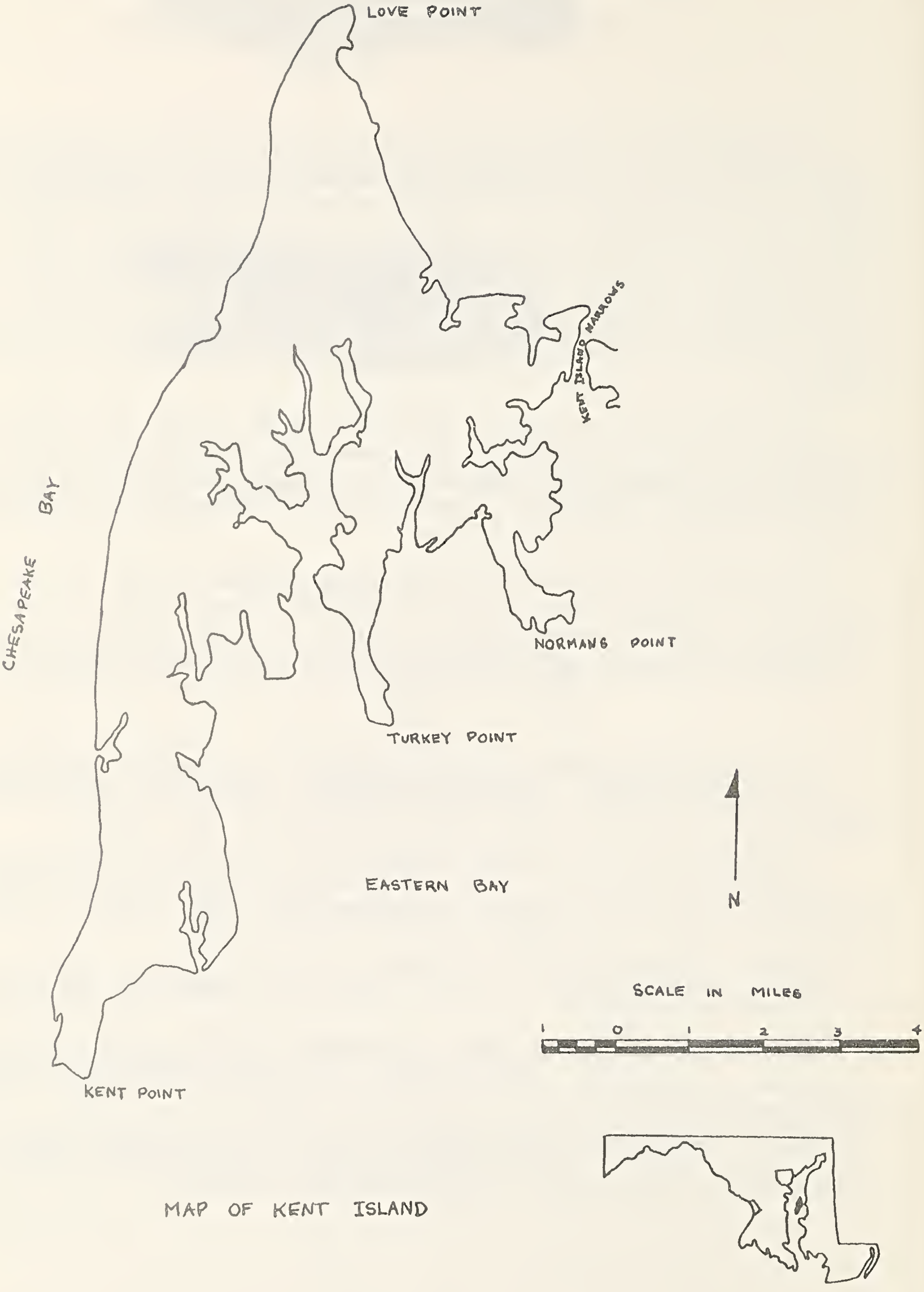


Fig. 1 MAP OF KENT ISLAND

Hyla cinerea Green Treefrog. Very common in cattail marshes in the southern portion during the summer. Specimens were observed to enter soybean fields during the latter part of summer. Two specimens are catalogued (A 4146 NHSM, A 4147 NHSM) in the collection of the Natural History Society of Maryland.

Pseudacris triseriata kalmi New Jersey Chorus Frog. Specimens were heard calling at Kent Point and from the northern portion of the island.

Rana catesbiana Bullfrog. Very common in marshes in the southern portion of the island.

Rana clamitans melanota Green Frog. Common in all bodies of fresh water on the island.

Rana sphenocephala Southern Leopard Frog. Perhaps the most common amphibian on the island and can be found in most wet environments.

Sceloporus undulatus hyacinthinus Northern Fence Lizard. Two specimens were released on the property of Dr. R. V. Truitt during the summer of 1969 but have not been observed since and probably did not become established on the island.

Opheodrys aestivus Rough Green Snake. Appears to be common at least in the southern portion of the island.

Coluber c. constrictor Northern Black Racer. Common, one specimen was observed on Swamp Mallow in the middle of a large marsh apparently searching for eggs and young of Redwinged Blackbirds.

Elaphe o. obsoleta Black Rat Snake. Very common, often observed in trees foraging for birds and eggs.

Natrix s. sipedon Northern Water Snake. The most common snake on the island. It can be found in all bodies of water and was even observed in the Chesapeake Bay.

Thamnophis s. sirtalis Eastern Garter Snake. Common in the southern portion of the island.

Kinosternon s. subrubrum Eastern Mud Turtle Very common in all bodies of water. Eggs of this species were found on a beach adjacent to the Chesapeake Bay near Kent Point. Harris (1969), also records this species from the island.

Chelydra serpentina Common Snapping Turtle. Two DOR specimens were found from the northern and southern portions of the island.

Clemmys guttata Spotted Turtle. Specimens were observed from the southern portions of the island. Harris (1969), also records this species from Kent Island.

Terrapene c. carolina Eastern Box Turtle. Very common, found in a variety of habitats on the island.

Malaclemys t. terrapin Northern Diamondback Terrapin. Very common in the Chesapeake Bay surrounding the island. Egg clutches were found in fields and on beaches.

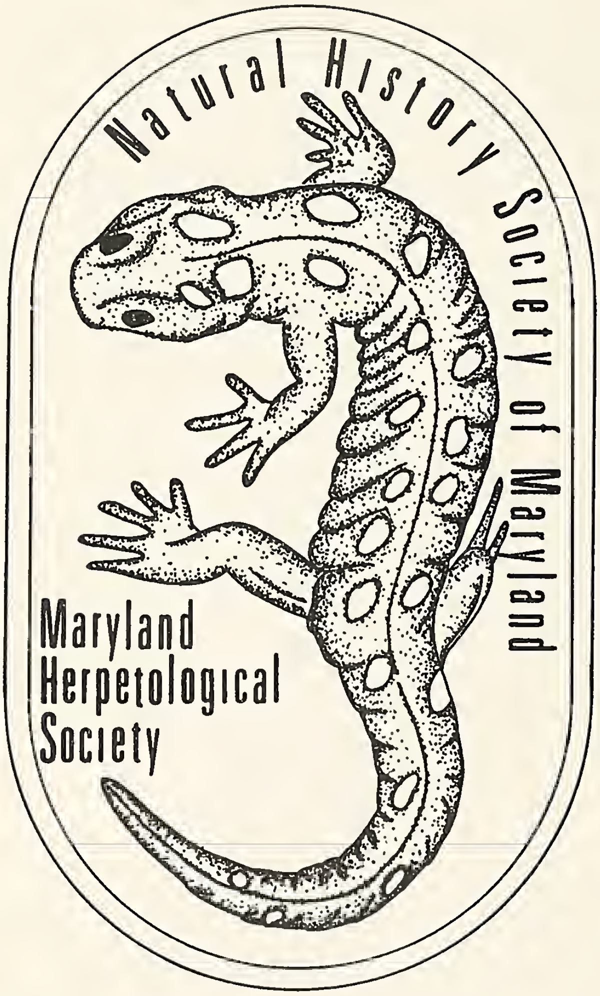
Chrysemys p. picta Eastern Painted Turtle. Specimens were observed in marshes near Kent Point.

Literature Cited

Harris, H. S., Jr.
1969. Distributional survey: Maryland and the District of Columbia. *Bull. Md. Herp. Soc.* 5(4): 97-161.

—*Department of Entomology, University of Maryland, College Park, Maryland, 20742*

Received 29 June 1973


Natural History Society of Maryland
Maryland Herpetological Society

LIBRARIES SMITHSONIAN INSTITUTION

SMITHSONIAN INSTITUTION LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 00962 9866